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Authoriser	Darryl Cuzzubbo – Asset President Olympic Dam	**Version Number**	17

1 INTRODUCTION

Throughout the EPMP documentation cross-references to certain commitments and government conditions have been included, appearing as a prefix with numbers following (e.g. (Aus xx)). See section 1.2.2 for more details.

1.1 Purpose and scope

BHP Billiton Olympic Dam Corporation Pty Ltd (ODC) conducts underground and open pit mining activities on the **Special Mining Lease** (SML) and associated treatment, transport and infrastructure related activities to the north, south and east of Roxby Downs (ODC's Olympic Dam operations) (Aus 5a; State 17a).

The **Environmental Protection and Management Program** (EPMP) comprises the following documents:

- this Environmental Management Manual (EMM);
- the Environmental Management Program (EM Program), a document that is organised and presented in distinct categories or 'EM Program IDs', each relating to different **environmental aspects** of ODC's Olympic Dam operations;
- the Monitoring Programs (MPs);
- the Mine Closure and Rehabilitation Plan.

The EMM provides background information, explains the environmental management system used to manage environmental risks and obligations in relation to ODC's Olympic Dam operations and explains the regulatory framework for the EPMP and how the EPMP operates (including the enforcement regime). The regulatory framework applicable to the EPMP is outlined in section 2.1.

The EM Program sets out potential significant **environmental aspects and impacts** and the processes, systems and actions used to manage them. The MPs set out how requirements of the EM Program are measured. The Mine Closure and Rehabilitation Plan sets out a plan for the closure and rehabilitation of the mine.

The EPMP serves (and has been prepared and submitted for) the purposes set out in section 1.1 as follows.

1.1.1 Indenture Clause 11 Program

Clause 11 of the **Indenture** requires the submission of a programme for the protection, management and rehabilitation (if appropriate) of the environment (**Clause 11 Program**). The **Clause 11 Program** submitted for that purpose comprises only the provisions of the EPMP identified in Table 7.2 as relating to South Australian Government Condition number 17 (along with the relevant parts of the EMM.

The **Clause 11 Program** has been prepared to also meet the requirements of the **Amended Indenture**.

1.1.2 Indenture Clause 13 Monitoring Program

Clause 13 of the **Indenture** requires the collection of data from a monitoring system approved by the State for collection of adequate data for the management of the use of underground water resources. Monitoring Program – Great Artesian Basin (GAB) - Document No. 2789, included in the EPMP (along with any relevant parts of this EMM) is submitted for that purpose.

1.1.3 EPBC Act Program

Condition 4 of the **EPBC Act Approval Conditions** requires the submission of 'an environmental protection management program' (EPBC Act Program). The conditions set out various requirements for the EPBC Act Program. The EPMP includes an EPBC Act Program submitted for these purposes. The EPBC Act Program comprises only the provisions of the EPMP that are identified in Table 7.1 (along with any relevant parts of this EMM). For the purposes of condition 7 of the EPBC Act Approval, which requires the EPBC Act Program to be implemented, the provisions of the EPMP identified in Table 7.1 will only apply following **Substantial Commencement**.

1.1.4 Major Development Approval Conditions

The **Major Development Approval Conditions** require the submission of various plans and programs. The conditions set out various requirements for the plans and programs. The EPMP incorporates the following plans and programs for these purposes:

- Fauna Management Plan required by condition 8;
- Greenhouse Gas and Energy Management Plan (GG&EMP) required by condition 11;
- Social Management Plan (SMP) required by condition 14;
- Environmental Protection Management Program required by condition 17;
- Regional Groundwater Management and Monitoring Program for the GAB and Yarra Wurta Springs required by condition 28;
- Site Groundwater and Surface Water Monitoring Program required by condition 32;
- Traffic Management Plan required by condition 42; and,
- Air Quality Management and Monitoring Program (AQMMP) required by condition 48.

The above plans and programs submitted for these purposes comprise only the provisions of the EPMP identified in Table 7.2 as relating to the condition requiring the plan or program (along with any relevant parts of this EMM).

1.1.5 Mining Code

Licence LM1, the *Radiation Protection and Control Act (1982)* and Clause 10 of the Indenture require compliance with the **Mining Code**. Clause 2.8 of the **Mining Code** requires that a Radioactive Waste Management Plan (RWMP) be presented for approval before commencement of any stage of an operation. The RWMP must undergo regular review and re-approval from time to time. The EPMP incorporates the RWMP and therefore there is no standalone RWMP. The RWMP comprises only the provisions of the EPMP that are identified in Table 8.1 (along with any relevant parts of this EMM) (MC 2.3.1, 2.3.4, 2.8.1).

1.1.6 Other information

The EPMP also serves the following purposes:

- To consolidate the requirements of various other licences, approvals and obligations (including, for example, requirements of EPA South Australian (SA) Licences), and ODC internal requirements.
- To describe how the environmental requirements of BHP Billiton's Health, Safety, Environment and Community (HSEC) Management System (including the EMS) apply and are incorporated into ODC's current and future expanded operations at Olympic Dam.
- To serve as a site standard that contributes to ODC's minimum commitment to environmental management in accordance with AS/NZS ISO 14001:2004 Environmental Management Systems – requirements with guidance for use (Standards Australia 2004) (including, for example, the information contained in sections 3.5 and 4 and Appendices E and F of the EMM).

This Information is included in the EPMP for information purposes only and can change from time to time without notice. The information does not form part of the plans and programs referred to in sections 1.1.1, 1.1.2, 1.1.3, 1.1.4 or 1.1.5.

1.1.7 Term

The EPMP has no set term or expiry date.

1.2 How to use the EPMP

1.2.1 EPMP structure

The EPMP consists of a number of documents which form a portion of the **Environmental Management System** (EMS) requirements. The EMS is described in further detail in section 4 below. A brief summary of each document within the EPMP, and reference to further information, is shown in Table 1.1.

Table 1.1: EPMP structure

Document	Content summary	Further information
EMM	• General overview of the EPMP. • Purpose and scope. • Regulatory framework. • Background information about Olympic Dam and the expansion. • Overview of the structure and requirements of the **Environmental Management System**. • Glossary of defined terms. • Cross-referencing of EPMP content to approval conditions and the requirements of the **Mining Code**.	This document
EM Program	Addresses potentially significant environmental aspects and impacts, identified through analysis and prioritisation of environmental risks, legal obligations and community concerns. Documents the processes, systems and actions used to manage the prioritised aspects and impacts.	• section 3.5.2 • section 4.3.4 • EM Program
MP(s)	Address assessment and performance of the EM Program's outcomes, compliance criteria and targets, control mechanisms and legal and other requirements.	• section 3.5.2 • section 4.5.1 • MP(s)
Mine Closure and Rehabilitation Plan	A plan for closure and rehabilitation of the mine, including the environmental outcomes expected to be achieved indefinitely, and options for progressive rehabilitation.	MCRP

1.2.2 Referencing of conditions, commitments and management measures

Cross-referencing has been provided throughout the EPMP to identify where it addresses:

- the requirements of the EPBC Act Approval Conditions;
- the requirements of the Major Development Approval Conditions;
- the requirements of the **Mining Code**;
- the requirements of Environment Protection Authority (SA) Licences and Exemptions;
- commitments made in the 2009 Draft Environmental Impact Statement and 2011 Supplementary Environmental Impact Statement (**EIS**).

Where a section of the EPMP addresses a relevant obligation, a cross-reference appears in the form shown in Table 1.2. Cross-reference tables provided in Appendix A1, Appendix A2 and Appendix B of this document provide a guide to the section of the EPMP where a specific condition is addressed. Any other content not specified in Appendix A1, Appendix A2 and Appendix BAppendix B (and the EPMP) as relating to a legal obligation (i.e. **EPBC Act Approval Condition** or **Major Development Approval Condition**) does not form part of the program submitted for the purpose of satisfying those obligations.

Table 1.2: Conditions cross-reference types

Cross-reference	Reference type	Reference table
(Aus xx) e.g. (Aus 5a)	Australian government approval condition as listed in the EPBC Act Approval Conditions	Appendix A1, Table 7.1
(State xx) e.g. (State 17g)	SA government approval condition as listed in the Major Development Approval Conditions	Appendix A2, Table 7.2
(MC xx) e.g. (MC 2.8.1)	Requirement of the nominated section of the Mining Code	Appendix B, Table 8.1
(DEIS xx) e.g. (DEIS 17.5.3)	Commitment made in the nominated section of the 2009 Draft Environmental Impact Statement	NA
(SEIS xx) e.g. (SEIS 18.2)	Commitment made in the nominated section of the 2011 Supplementary Environmental Impact Statement	NA
(EPA xxxxx.xxx-xxx) e.g. (EPA 1301.330-168)	Conditions in the specified EPA Licence or Exemption clause	Appendix C, Table 9.1

1.2.3 Glossary and defined terms

Throughout the EPMP some terms are taken to have specific meaning. These are indicated in bold text in the documentation and are defined in the glossary in section 5. Defined terms have the same meaning wherever they appear in bold text. Some other terms and acronyms are also defined in the glossary, but do not appear in bold text.

2 REGULATORY FRAMEWORK

2.1 Key legal requirements

The EPMP has been prepared within the regulatory framework and to comply with certain key legal requirements, as described below in this section 2.1. EMS key legal requirements and other obligations are described in further detail in section 4.3.2 below.

2.1.1 Indenture

2.1.1.1 Background

The **Indenture** applies to and governs BHP Billiton's Olympic Dam operations. The **Indenture** was ratified and approved, and its implementation by the State authorised, by the **Ratification Act**.

2.1.1.2 Amendment of the Indenture

The **Indenture** has been amended several times since it was originally signed in 1982. It has been most recently amended by Variation Deed dated 12 October 2011 which was ratified by the **Amendment Act**. The Governor of South Australia gave his assent to the **Amendment Act** on 8 December 2011 and proclaimed that the Act came into operation on 15 December 2011.

The amendments to the **Indenture** will only take effect if the Indenture Minister publishes a notice in the *Government Gazette* that he has received a Project Notice for the OD (Stage 1) Project (as defined in the Variation Deed) before 10 October 2016. The OD (Stage 1) Project includes the development of an open pit mine to the production stage and all other works which are necessary preliminaries to the development of the mine.

2.1.1.3 Ratification Act

The **Ratification Act** authorises the implementation of the **Indenture** (including the requirement that a **Clause 11 Program** approved pursuant to clause 11 of the **Indenture** be implemented), and the State and its authorities must do all things necessary to give full effect to the **Indenture**.

The **Ratification Act** also modifies State laws to the extent required to give effect to the **Indenture**. If there is any inconsistency between the **Indenture** and other State laws, including the *Mining Act 1971* (SA), the provisions of the **Indenture** prevail to the extent of the inconsistency.

2.1.1.4 Indenture provisions

The following provisions of the **Indenture** are relevant to this EMM (and the EPMP):

- Clause 10 of the **Indenture**. This clause requires compliance with the various Codes of Practice in relation to radiation protection, which have been issued by the appropriate Commonwealth Government department (now ARPANSA). Additionally, Codes of Practice, as issued by the IAEA and the published recommendations of the ICRP are to be complied with.

One of those codes, the **Mining Code**, outlines specific requirements for environmental radiation and radioactive waste management, which have been incorporated into the wider EPMP. Appendix B contains a cross-reference of the requirements in the **Mining Code** and the section of ODC's environmental management documentation where those requirements are addressed.

- Clause 11 of the **Indenture**. This clause requires ODC to prepare and implement a program for the protection, management and rehabilitation (if appropriate) of the environment (**Clause 11 Program**) in respect of the Initial Project and Subsequent Projects (as those terms are defined in the Indenture), including arrangements with respect to monitoring and the study of sample areas to ascertain the effectiveness of the program.

The EPMP includes a program prepared to comply with clause 11. The **Clause 11 Program** must be submitted to the Indenture Minister for approval. The Indenture Minister may approve, approve with conditions, vary as he thinks reasonable, or refuse to approve the program.

ODC must also prepare an annual environmental management and monitoring report to report on compliance with the **Clause 11 Program**.

Once the **Amended Indenture** takes effect, it will provide a revised regulatory framework for the review and enforcement of the **Clause 11 Program.** Until then, it is intended that the procedures for review, amendment and enforcement set out in sections 2.3 and 2.5.1 below apply in connection with the Clause 11 Program in this EPMP.

Clause 11A of the **Amended Indenture** also requires the **Clause 11 Program** to incorporate the Greenhouse Gas and Energy Management Plan which ODC is required to develop and have in place under condition 11 of the Major Development Approval. The requirements for the Greenhouse Gas and Energy Management Plan are set out in the Major Development Approval.

- Clause 13 of the **Indenture**. This clause sets out a regime to meet the water requirements for BHP Billiton's Olympic Dam operations. The **Indenture** gives ODC the right to explore for underground water and, if a source is located, apply for a **Special Water Licence** to take water from that source. The State has granted two **Special Water Licences** to ODC under these provisions (SWL and SWL No. 2, related to Wellfields B and A, respectively), pursuant to which ODC extracts water from the Great Artesian Basin (GAB).

Clause 13 requires ODC to design, install and maintain an appropriate monitoring system approved by the State to collect data for the management of the use of underground water resources, including collecting data in relation to total abstraction on an individual well and wellfield basis, water pressures and levels in all wells and at the boundary of the wellfields designated areas and water qualities. ODC must submit to the State an annual report, prepared by a competent hydrologist or hydrogeologist, about the use of aquifers, aquifer response and future water exploration, development, production and management.

- Clause 12(5) of the **Amended Indenture** requires ODC to prepare and submit an Industry and Workforce Participation Plan (IWPP) within nine months of the date the Amendment Act was ratified. Any references in the EPMP to the IWPP, and any statements identified as being IWPP content are provided for information only and do not form part of the EPMP submitted for approval purposes (but may be submitted separately under Clause 12 of the **Amended Indenture**).

The EPMP has been designed to comply with certain requirements of both the **Indenture** and the **Amended Indenture**. If the **Amended Indenture** has not taken effect, the parts of the EPMP which make specific reference to the **Amended Indenture** and requirements under it will not apply.

2.1.2 EPBC Act Approval Conditions

Condition 4 of the **EPBC Act Approval Conditions** requires ODC to develop, and submit to the relevant minister for approval, an environmental protection management program in relation to Mining and Processing (as those terms are defined in the EPBC Act Approval Conditions). Conditions 5 to 12 of the **EPBC Act Approval Conditions** set out details of the requirements for, and processes regarding, the environmental protection management program.

Condition 30 of the **EPBC Act Approval Conditions** requires ODC to conduct a review of the activities covered by schedule 1 of the approval (related to mining and processing) every ten years to confirm that **Best Practicable Technology (BPT)** is being used to minimise **environmental impacts** and risks. A report must be provided on the outcomes of the review within three months of completing the review. (Aus 30)

2.1.3 Major Development Approval Conditions

Conditions 17 to 19 of the Major Development Approval relate to environmental management. Condition 17 requires ODC to prepare an Environmental Protection and Management Program in accordance with clause 11 of the **Indenture**, for approval by the Indenture Minister, and sets out a range of matters to be included. Condition 18 requires ODC to prepare an annual environmental management and monitoring report in accordance with clause 11 of the **Indenture**, to report on compliance with the program. Condition 19 requires ODC to implement the approved program.

In addition, a number of other conditions of the Major Development Approval require the submission of various plans and programs, a number of which are addressed in the EPMP documents (as identified in Table 7.2).

2.1.4 Conditions of radiation licence

(MC 2.8.1, 2.9.1, 2.9.2, 2.9.3, 2.9.4, 2.9.5, 2.9.6, 2.10.1(c), 2.10.1(e), 2.10.1(g))

ODC has been granted **Licence LM1** under the *Radiation Protection and Control Act (1982)* (Radiation Licence). Compliance with the **Mining Code** is a condition of the Radiation Licence.

Under the **Mining Code**, ODC is required to seek formal authorisations for specific stages of the operation (i.e. construction, operation and closure), based on a regularly reviewed and approved RWMP which (as noted in section 1.1.5) is integrated into the overall EPMP. ODC is also required to

ensure that the appropriate authority be kept informed of proposed changes to the operation to which the Mining Code applies, and seek approval and authorisation for changes.

2.2 Compliance with routine reporting obligations

Certain reporting obligations (outlined in section 2.1) under the **Indenture**, the **EPBC Act Approval Conditions**, the **Major Development Approval Conditions**, the Licence LM1 and EPA licences are fulfilled by ODC preparing and submitting the documents in Table 2.1.

Table 2.1: Routine reporting obligations

Document	Document component	Key legal requirement satisfied
Environmental Management and Monitoring Report (EMMR) (submitted annually)	Stand alone	• Indenture (clause 11(6)) • Amended Indenture (clause 11(8)) • Major Development Approval Conditions (State 18) • EPBC Act Approval Conditions (Aus 10b, 99)
Great Artesian Basin Wellfields Report (submitted annually)	Stand alone	• Indenture and Amended Indenture (clause 13)
LM1 Annual Report (in part)	Stand alone	• Licence LM1 reporting requirements.
Best Practicable Technology review report (submitted every 10 years)	Stand alone	• EPBC Act Approval Conditions (Aus 30)
Monthly notification of emission events (Monthly EPA smelter report)	Stand alone	• EPA Licence No. 1301 • EPA Exemption No. 3014

2.3 Amendments to the EPMP

ODC is able to amend the provisions of this EPMP submitted for the purposes specified in sections 1.1.1, 1.1.2, 1.1.4 and 1.1.5 at any time by submission to the Indenture Minister of an application to amend the EPMP together with all monitoring and modelling data required to enable the Indenture Minister to make a decision on the application. Following approval by the Indenture Minister, the EPMP provisions shall be amended as approved.

The Indenture Minister provides a blanket approval in accordance with recommendations made by the Department of Manufacturing, Industry, Trade, Resources and Energy (DMITRE) (Ref 98/24441, April 2002) of any amendments to **Clause 11 Programs** that do not diminish the effectiveness of the program and which are set out in an application made by ODC to, and approved by the Chief Inspector of Mines – DMITRE. Following approval of the amendments by the Chief Inspector of Mines, the EPMP provisions shall be amended as approved. In the event that no approval is received within two months of such an application, ODC may make an application in respect of the same subject matter to the Indenture Minister.

Once the Amended Indenture takes effect, clause 11(10) will provide that ODC may submit a revision to the **Clause 11 Program** for approval by the Indenture Minister under a similar process as that which applied to the original program. Following approval by the Indenture Minister, the program is amended as approved.

Under Condition 10 of the EPBC Act Approval Conditions, the provisions of the EPBC Act Program submitted for the purposes specified in sections 1.1.3 must be reviewed at least every three years from the date of its first approval, or as otherwise specified in writing by the relevant Minister. A report on the review must be provided to the Minister addressing (Aus 10):

- the effectiveness of the program over the preceding period (Aus 10a);
- the monitoring results over the preceding three years and the extent to which **compliance criteria**, **leading indicator** criteria and target criteria have been met (Aus 10b);

- whether the **compliance criteria** should be revised to improve measurement of the achievement of the outcomes, taking into account the latest scientific information (Aus 10c);
- whether the **leading indicator** criteria can be revised to provide a better early warning of potential non-compliance (Aus 10d);
- whether target criteria should be changed to reflect a level of impact for **members of the public** that is as low as reasonably achievable and for non-human biota that risks are minimised to the lowest reasonable levels (Aus 10e);
- opportunities for improved monitoring methods (Aus 10f);
- the outcome of risk assessments undertaken over the preceding three years (Aus 10g);
- ODC's response to the review, including any proposed revisions to the program (Aus 10h);
- the information on which the review was based (Aus 10i);
- the expertise used in undertaking the review (Aus 10j);
- any other findings and recommendations from the review (Aus 10k).

Condition 12 of the EPBC Act Approval Conditions allows ODC to revise the relevant provisions of the EPMP by submission of proposed changes to the relevant Minister for approval.

Condition 84 of the EPBC Act Approval Conditions also allows ODC, if it wants to act other than in accordance with an approved plan, to submit a revised plan to the relevant Minister for approval. If approved, the revised plan replaces the originally approved plan (Condition 85).

2.4 Environmental outcomes and criteria

(State 17g, 17h)

2.4.1 Basis of environmental outcomes and criteria for measurement

ODC has included a number of **environmental outcomes** and **compliance criteria** in the EPMP. The purpose of including **compliance criteria** is to assist ODC to demonstrate, to government departments and the Indenture Minister, compliance with the **environmental outcomes** specified in the EPMP.

Once the **Amended Indenture** takes effect, it will specifically provide that the **Clause 11 Program** may set out an outcomes-based regulatory regime that provides for:

- a set of outcomes and a set of criteria for measuring the achievement of those outcomes as the basis for compliance;
- the implementation of appropriate monitoring or management systems in relation to the outcomes.

The **EPBC Act Approval Conditions** also provide that the EPBC Act Program must specify the **environmental outcomes** to be achieved in relation to a range of matters, and **compliance criteria** to demonstrate compliance with the conditions.

The **environmental outcomes** and **compliance criteria** in the EPMP were developed for the key **environmental aspects and impacts** which were prioritised during the environmental risk assessment process (see section 4.3.1). In preparing the **environmental outcomes** and **compliance criteria** ODC considered the Olympic Dam Sustainable Development Commitment, legal and other requirements (including the Guidelines for miners: preparation of a mining lease proposal or mining and rehabilitation program (MARP) in South Australia published by DMITRE 2009), significant **environmental aspects**, technological options, financial, operational and business requirements, past environmental performance and the views of interested stakeholders.

Risks which had a very low probability, or were trivial in consequence without the use of specialised control measures, were not designated a specific **environmental outcome** or **compliance criteria**.

A comprehensive review of the **environmental outcomes** and **compliance criteria** is conducted during the triennial review of the EPMP. Minor reviews are conducted annually and, where necessary, an amendment application is submitted in accordance with the process outlined above.

Environmental outcomes represent a commitment on the extent to which the operation will seek to limit **environmental impact** (natural, social and economic). The **environmental outcomes** are intended to be reasonable and realistically achievable, acceptable to affected parties and to meet other

applicable legislative requirements. **Environmental outcomes** are accompanied by **compliance criteria**. The criteria are described in terms that are specific, measurable and clearly enable confirmation that the **environmental outcomes** have been achieved.

It is intended that the compliance by ODC with the regulatory framework set out above be assessed according to the **compliance criteria**. Details on how **compliance criteria** are measured (such as location, frequency and methodology) is included in the MPs.

The **environmental outcomes** and **compliance criteria** for Olympic Dam are provided in Appendix D.

2.4.2 Leading indicator and target criteria

Leading indicator and **target criteria** are provided, where appropriate, to support the **environmental outcomes** and **compliance criteria**.

2.4.2.1 Leading indicator criteria

Where advance warning is required that a management control may be failing and there is a subsequent risk that a **compliance criteria** may not be met, **leading indicator** criteria are given. **Leading indicators** are not required for all **environmental outcomes** and **compliance criteria**, but are provided in circumstances where early warning is necessary and possible.

2.4.2.2 Target criteria

The **Major Development Approval Conditions** require certain plans and programs to include **target criteria** to reflect a level of **environmental impact** that is as low as reasonably achievable (State 17e). The **EPBC Act Approval Conditions** require certain parts of the EPBC Act Program to include **target criteria** that reflect a level of impact that is as low as reasonably achievable for radiation exposure to humans, or minimised to the lowest reasonable levels for non-human biota (Aus 5f, 14, 20). The EPMP identifies **target criteria** which relate to the conditions outlined above. In addition to those **target criteria**, the EPMP also includes targets to indicate a long-term aspirational goal, or an interim target leading to a long-term goal.

An inconsistency arises with the **EPBC Act Approval Conditions** related to radiation (Aus 14), which require **target criteria** that are equivalent to the **leading indicator** criteria required by the Major Development Approval Conditions (State 34). To resolve this, the **target criteria** required for **EPBC Act Approval Condition** 14 have been included as **leading indicators**, but should still be treated as **target criteria** for the purposes of condition 14 of the EPBC Act Approval.

2.4.3 Failure to achieve an environmental outcome

The **Amended Indenture** sets out a process for enforcement of the **Clause 11 Program** in certain circumstances (clause 11(11)). This includes where an **environmental outcome** specified in the EPMP is not achieved according to the applicable criteria.

The process for enforcement, when instigated, involves a series of steps including preparation, approval and implementation of a mitigation plan, ministerial direction to take action if the mitigation plan is not complied with, a ministerial right to take that action if the ministerial direction is not complied with and the payment by ODC of the costs of the Indenture Minister taking that action.

2.5 Enforcement process

2.5.1 Indenture, Major Development Approval Conditions and Mining Code

The process set out in this section applies to the provisions of this EPMP submitted for the purposes specified in sections 1.1.1, 1.1.2, 1.1.4 and 1.1.5.

The enforcement process applies when one of the following events occurs or the Indenture Minister has reasonable cause to believe one of the following events is likely to occur (each being a non-compliance matter):

- a failure to achieve an **environmental outcome** (according to the applicable criteria) specified in the EPMP;
- an unexpected material detriment to the environment occurring as a result of ODC's operations under the **Indenture**;
- a breach of any condition or requirement of any Project Approval included in the EPMP.

ODC will give written notice of any of these non-compliance matters to the Indenture Minister as soon as reasonably practicable after becoming aware of them. (State 17i)

Once notice of a non-compliance matter is given by either ODC or the Indenture Minister to the other (and, where the non-compliance matter is a failure to achieve an **environmental outcome**, if the Indenture Minister is of the opinion (acting reasonably) that there has been or is likely to have been a failure to achieve the **environmental outcome** itself, or that the matter might reasonably be expected to lead to a failure to achieve the **environmental outcome** itself, in each case which has an environmental impact), the Indenture Minister may require ODC to prepare a **Mitigation Plan** to manage or mitigate the adverse **environmental impact** or detriment and require a return to compliance with the EPMP.

The **Mitigation Plan** must be submitted to the Indenture Minister for approval and clauses 11(2) to 11(5) of the Indenture will apply to the plan (with any necessary modifications). If ODC fails to comply with an approved **Mitigation Plan**, the Indenture Minister may give a written direction to ODC to take the action. If ODC does not comply with the Indenture Minister's direction within two months (or any other period reasonably required or otherwise agreed), the Indenture Minister may take the action specified in the direction and ODC will pay the reasonable actual costs of the action.

ODC will not be regarded as being in default in connection with a failure to implement any relevant provision of the EPMP unless:

- ODC fails to do the following (each being a Mitigation Plan Failure):
    - submit a required Mitigation Plan;
    - comply with a Ministers direction within the applicable period; or
    - pay the Indenture Minister's costs of taking the action in a direction; or
    - the Indenture Minister considers, acting reasonably, that the effects of the failure are so significant that to ensure the effects can be managed appropriately and responsibly the consequences of the breach should not be confined to this enforcement process.

2.5.2 EPBC Act Approval Conditions

This section applies to the provisions of this EPMP submitted for the purposes specified in section 1.1.3.

2.5.2.1 Basis of compliance criteria

Condition 5(d) of the **EPBC Act Approval Conditions** provides that the EPBC Act Program must specify **compliance criteria**, to demonstrate compliance with five particular **EPBC Act Approval Conditions**.

To comply with condition 5(d), ODC has formulated certain **compliance criteria** and included them in the EPMP. The **compliance criteria** are measurable standards or parameters that can be used to demonstrate achievement of a required **environmental outcome** in respect of the relevant **EPBC Act Approval Conditions**. Therefore, the **compliance criteria** are not themselves the ultimate measure of compliance, but rather, they are a means of demonstrating compliance.

2.5.2.2 Process in the EPBC Act Approval Conditions for addressing certain failures

The enforcement process under the **EPBC Act Approval Conditions**, which applies from the date of granting of the EPBC Act Approval (10 October 2011), is instigated when the Department of Sustainability, Environment, Water, Population and Communities (the Department) becomes aware (either by notice given by ODC under condition 104 of the **EPBC Act Approval Conditions** or otherwise) of either of the following events (each being a non-compliance matter):

- a failure to meet a **compliance criteria** which has been specified by ODC in the EPMP, for the purpose of demonstrating the achievement of an **environmental outcome**, and therefore compliance with the **EPBC Act Approval Conditions**;
- any other non-compliance or potential non-compliance with the **EPBC Act Approval Conditions**.

Note that:

- A failure to meet a **leading indicator** criteria does not represent a non-compliance matter but remedial action (as specified in the relevant EM Program) must be taken in response.

- A failure to meet a **target criteria** does not represent a non-compliance matter but ODC must review practices if criteria are exceeded and endeavour to meet the **target criteria**.

It is important to note that these non-compliance matters may not necessarily constitute a breach of the EPBC Act or a breach of the **EPBC Act Approval Conditions.** Non-compliance matters trigger the process for the Department to assess and, where necessary, address a non-compliance which is set out in the **EPBC Act Approval Conditions**. The process set out in the **EPBC Act Approval Conditions** is summarised in the table below**.**

Table 2.2: EPBC Act Approval Conditions process

Occurrence	Non-compliance matter?	Response required from ODC
Failure to meet compliance criteria which has been specified by ODC in the EPMP for the purpose of demonstrating the achievement of an environmental outcome.	Yes (Aus 5d)	• Report the non-compliance to the Department within two business days of first becoming aware of the non-compliance (Aus 104a). • Take its own remedial action, if ODC considers necessary. • Report any remedial action within such time as is reasonable in the circumstances (unless required by the Minister to bring the matter into compliance within a time frame specified in writing by the Department) (Aus 104c). • Take any specific measures as determined by the Minister within the period specified by the Minister (Aus 105).
Any other non-compliance with the EPBC Act Approval Conditions (not a failure to meet a compliance criteria, leading indicator criteria or target criteria).	Yes	• Report the non-compliance to the Department within 30 business days of first becoming aware of the non-compliance (Aus 104b). • Take its own remedial action, if ODC considers necessary. • Report any remedial action within such time as is reasonable in the circumstances (unless required by the Minister to bring the matter into compliance within a time frame specified in writing by the Department) (Aus 104c). • Take any specific measures as determined by the Minister within the period specified by the Minister (Aus 105).
Failure to meet a leading indicator criteria.	No (Aus 5e)	• Take remedial action as specified in the relevant EM Program (Aus 5e).
Failure to meet a target criteria.	No (Aus 5f)	• Review practices and endeavour to meet the target criteria (Aus 5f).

If the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities is not satisfied that ODC is complying with any of the **EPBC Act Approval Conditions**, the Minister may require ODC to undertake, within a period specified by the Minister, specific measures as determined by the Minister (Aus 105). The measures may include, but are not limited to, requiring further studies, mitigation strategies or offsets; or use of specified technologies. ODC must comply with any such requirement.

The Department will undertake (pursuant to its Compliance and Enforcement Policy dated 1 December 2009) an initial assessment to ascertain priority for further compliance and enforcement action. Initial assessment includes a preliminary examination of the non-compliance matter to decide the likelihood that a contravention of the **EPBC Act Approval Conditions** has occurred, its seriousness and enforcement action.

Based on the outcome of its initial assessment, the Department will determine the appropriate level, if any, of further investigation or response. The Department may:

- elect to not pursue the matter further;
- elect to not proceed with further investigative action, but take action to increase awareness and encourage compliance;
- elect to not proceed with further investigative action, but implement a mid-range compliance response; or
- proceed with further investigative action.

If the Department determines there has been a contravention of the **EPBC Act Approval Conditions**, it will determine the appropriate response to the contravention.

2.6 ALARA and best practicable technology

(MC 2.10.1(b))

The BHP Billiton HSEC philosophy of 'zero harm' is consistent with the broad concepts of **BPT** and **ALARA**.

BPT usually refers to technology which minimises risks to people and the environment, now and in the future, that can reasonably be implemented taking social and economic factors into account.

BHP Billiton utilises leading design, engineering and construction techniques to ensure that operations and facilities are designed and built to appropriate standards. In this regard, BHP Billiton undertakes regular reviews of the available and emerging technology and, where appropriate, implements that technology.

The **ALARA** principle is more specific, applying to radiation protection. It is one part of the International Commission on Radiological Protection (ICRP) system of dose limitation, which in turn forms the basis of BHP Billiton's approach to radiation protection. Radiation exposures to workers, the public and the environment are maintained 'as low as reasonably achievable', with social and economic factors taken into account.

BHP Billiton is developing processes to ensure that **ALARA** studies (also known as optimisation studies) are conducted on new projects.

3 GENERAL BACKGROUND INFORMATION

3.1 History

WMC Resources Limited began exploring South Australia for copper deposits in 1961. In 1972, a review of historical geological data combined with various geological models led WMC geologists to focus on the region west of Lake Torrens. This led to the discovery of a prospective ore deposit in 1977.

Because of the likely cost of developing that deposit, WMC Resources Limited entered into a joint venture with the BP Group in July 1979. Production at Olympic Dam commenced in 1988 at a rate of 45,000 tonnes per annum (tpa) of refined copper plus associated products.

In 1993, WMC (Olympic Dam Corporation) Pty Ltd acquired the interest held by the BP Group. In June 2005 BHP Billiton acquired WMC Resources and WMC (Olympic Dam Corporation) Pty Ltd became BHP Billiton Olympic Dam Corporation Pty Ltd.

In 1997, after the release of an Environmental Impact Statement, government approval was obtained to increase copper production at Olympic Dam to up to 350,000 tpa.

Approval was obtained from the South Australian and Commonwealth governments in October 2011 to further expand the mine to up to 750,000 tpa through the construction of an open pit mine, additional processing facilities and associated infrastructure.

In August 2012 BHP Billiton announced that it would investigate an alternative less capital intensive design of the Olympic Dam open-pit expansion, involving new technologies, to substantially improve the economics of the project. As a result, it has not approved all aspects of the first stage of the project.

3.2 Location

Olympic Dam is located approximately 560 kilometres (km) north-north-west of Adelaide (see Figure 3.1) and 16 km north of the Roxby Downs township in the far north of South Australia.

Figure 3.1: Location of Olympic Dam

3.3 Olympic Dam region operating environment

(MC 2.8.2(b))

3.3.1 Climate

The climate is arid, with median annual rainfall of 160 mm and mean annual evaporation of 2,800 millimetres (mm). The temperature ranges from cool winters, with mean minima and maxima of 5 °C and 19 °C respectively, to hot summers with mean minima and maxima of 20 °C and 35 °C respectively.

3.3.2 Vegetation

The vegetation in the region is determined by the terrain structure and climate. The terrain consists of low parallel dunes with an east-west orientation. The dunes may be close together or separated by swales which vary in width, the narrowest in the southern parts of the Roxby Downs Municipality and the broadest north of the mine.

Vegetation on the dunes consists of low woodlands or tall shrublands of Northern Cypress Pine (*Callitris glaucophylla*), Horse Mulga (*Acacia ramulosa*), Narrow Leaved Hopbush (*Dodonaea viscosa*) and Sandhill Wattle (*Acacia ligulata*). The understorey consists mainly of grasses and ephemeral herbs. The pines are most common in the vicinity of Roxby Downs, becoming less common north of Olympic Village.

Swale vegetation is dominated by chenopod shrublands of Bladder Saltbush (*Atriplex vesicaria*) and Low Bluebush (*Maireana astrotricha*), with associated short-lived chenopods, grasses and ephemeral herbs. Some swales also contain low woodlands of Western Myall (*Acacia papyrocarpa*), with either a chenopod or grass understorey. Mulga (*Acacia aneura*) is common at the base of dunes and also on low sand rises, usually with a grassy or herbaceous understorey.

The broad swales north of the mine are dominated by Bladder Saltbush, Glasswort (*Sclerostegia tenuis*) and Bristly Sea-heath (*Frankenia serpylifolia*) with an understorey of grasses and ephemeral herbs.

3.3.3 Fauna

The mosaic of dunes and interdunal swales, woodland, shrubland, grassland and bare ground habitats in the Olympic Dam region supports a diverse fauna community.

Over 220 bird species have been recorded within the Olympic Dam region. No resident species are considered to be of major conservation significance. Many of the vagrant and migratory species, which have been classified by ODC as at-risk, have been recorded in the region. These include the Plains-wanderer (*Pedionomus torquatus*), Australian Bustard (*Ardeotis australis*), Flock Bronzewing (*Phaps histrionica*), Freckled Duck (*Stictonetta naevosa*) and Major Mitchell Cockatoo (*Cacatua leadbeateri*).

The local reptile community is diverse by world standards, although the regional pool of 47 species is less than that found in some other Australian arid zone habitats. Several large reptile species, including three venomous elapid snakes, are conspicuous elements of the local fauna.

By contrast, most of the 29 native mammal species recorded in the region are small and nocturnal and hence rarely seen. The Desert Mouse (*Pseudomys desertor*), which has been trapped on the SML, was once thought to be rare in South Australia but recent studies suggest that the rodent is widespread and secure. Notably, the Plains Rat (Pseudomys australis) and the Hopping Mouse (*Notomys alexis*) were recorded within the SML for the first time in 1998. Red Kangaroos (*Macropus rufus*) are common throughout the region. Rabbits (*Oryctolagus cuniculus*), cats (*Felis catus*) and foxes (*Vulpes vulpes*) are also common, and all have a significant adverse impact on the local ecosystem.

Trilling Frogs (*Neobatrachus centralis*) are the most common local vertebrate, but only surface following heavy rains.

3.3.4 Hydrogeology

There are two important groundwater systems in the Stuart Shelf: the Andamooka Limestone aquifer and the Tent Hill aquifer. These form the overlying cover sequence at Olympic Dam and consist of Cambrian shales and limestones and Late Proterozoic quartzite, sandstone and shale members, mostly of very low permeability.

The upper Andamooka Limestone is the shallowest of the aquifers in the Stuart Shelf and forms the regional 'water table' aquifer north of Olympic Dam. The water table typically occurs about 50 metres (m) below ground (i.e. 50 m Australian Height Datum (mAHD)), with groundwater in the aquifer moving

from west of the Stuart Shelf to the northern end of Lake Torrens, where the water table typically occurs less than 10 m below ground. Groundwater salinity is typically in the range of 20,000 to 60,000 milligram per litre (mg/L) on the SML, increasing to as much as 200,000 mg/L closer to Lake Torrens. For comparison, seawater salinity is generally around 35,000 mg/L.

The Tent Hill aquifer is extensive and forms the most important aquifer over the southern portion of the Stuart Shelf, where the Andamooka Limestone aquifer is either very thin or absent. It includes the lower parts of the Arcoona Quartzite and the Corraberra Sandstone units of the Tent Hill Formation and is therefore sometimes referred to as the Arcoona Quartzite aquifer or the Corraberra Sandstone aquifer. The aquifer occurrences reduce north of the SML due to a deepening of the unit and reduction in permeability.

At Olympic Dam, this aquifer typically occurs 160 to 200 m below ground level (about -60 mAHD to -100 mAHD). The depth increases moderately to the north, west and south, with the base of the unit occurring around 225m below ground level (-125 mAHD) near the existing underground mine and more than 400 m below ground level (-300 mAHD) north of Olympic Dam.

Groundwater salinity in the Tent Hill aquifer is generally higher than in the Andamooka Limestone, with reported concentrations ranging from about 35,000 to more than 100,000 mg/L in the vicinity of Olympic Dam, and ranging to around 200,000 mg/L closer to Lake Torrens.

The upper section of the Arcoona Quartzite unit forms an aquitard. This is a low-permeability layer that acts to restrict the movement of groundwater between the Andamooka Limestone aquifer and the Tent Hill aquifer.

3.3.5 Radiological environment

(MC 2.8.2(b))

Radionuclides occur naturally in the environment and have been extensively monitored in the Olympic Dam region since commencement of operations in the early 1980s.

To date, a significant quantity of data and information on environmental radiation has been collected and reported for ODC. Much of the data is summarised in the DEIS and SEIS for the Olympic Dam Expansion, with other routine results reported to government in annual Environmental Management and Monitoring Reports and the Radiation Protection and Control Act Licence Annual Report.

Overall, radon and radionuclide concentrations have increased above natural background levels close to the operation, and the impact of those increases has been shown to be negligible.

A summary of the DEIS and SEIS information is provided below.

3.3.5.1 Radon in air

Results of routine monitoring indicate that environmental radon concentrations, on average, range from a few becquerel's per cubic metre (Bq/m^3) to 55 Bq/m^3 (for passive monitors) and 30 Bq/m^3 (for active monitors). An extensive regional study using passive monitors, conducted in 2009 and 2010 for the SEIS, showed that radon concentrations at locations very close to the existing operations were elevated, falling to regional background levels (approximately 25 Bq/m^3) at distances beyond 4 km from the operations.

3.3.5.2 Radionuclides in airborne dust

Pre-operational annual dust mass concentrations (in $\mu g/m^3$) and ^{238}U and ^{226}Ra concentrations (in micro Becquerel per cubic metre ($\mu Bq/m^3$)) (for the years 1982 and 1983), were measured by high-volume dust samplers. These results are the most representative of pre-existing background levels.

More recent high-volume samples from Roxby Downs and Olympic Village show that the concentration of dust and radionuclides have remained consistent with the earlier sampling results. Dust concentrations are 25 to 70 $\mu g/m^3$, with ^{238}U and ^{226}Ra concentrations of 1 to 4 and 1 to 7.5 $\mu Bq/m^3$ respectively.

3.3.5.3 Radionuclides in flora

Background concentrations from pre-operational monitoring showed that there was a measurable difference between the radionuclide concentrations in species growing in sand compared to those growing on swales for ^{238}U, ^{230}Th and ^{226}Ra. In addition, concentrations of ^{210}Pb were elevated compared to the other long lived radionuclides in flora.

The most recent radionuclide sampling in flora was conducted in 2009. Mulga (*Acacia aneura*) was selected as the most representative species. The analysis showed no significant differences in radionuclide concentration in Mulga with direction from Olympic Dam and that radionuclide concentrations in vegetation are not elevated at distances greater than 5 km from the operation. There are no detectable impacts from the elevated radionuclide concentrations on the representative species found close to the operations.

3.3.5.4 Radionuclides in fauna

Fauna monitoring was initially conducted with the intent of assessing potential **members of the public** doses from consumption of animals. Subsequent assessment has determined that this human exposure pathway is negligible and therefore monitoring for this purpose was discontinued.

In 2006, BHP Billiton undertook a fauna sampling survey, specifically examining radionuclide concentrations in kangaroos from within the mine lease area and at a distance from the operation. Overall, the study showed no statistical difference in radionuclide concentrations between the two groups of animals tested.

BHP Billiton has moved to assessing impacts to fauna (and flora) as recommended by the ICRP (ICRP2008) through the ERICA assessment system (ERICA Program 2007).

3.3.5.5 Radionuclides in soils

Early pre-operational data reported radionuclide concentrations for different soil types and showed that levels were generally higher in clayey materials (such as in swales and claypans), and were consistent with world averages (UNSCEAR 2000). The results also showed no significant difference between surface and sub-surface soils.

Later studies enabled comparisons between soils close to the mine and at distance and showed that over time, radionuclide levels in soils have not changed markedly. Generally, radionuclide levels in soils close to the operation (i.e. within the SML) are higher than the levels outside the SML, although the increases are not uniform and in some cases the levels are higher in samples from outside the SML. Additionally, there does not appear to be a trend of increasing concentration levels over time, compared to the earlier results.

3.3.5.6 Radionuclides in groundwater

Background radionuclide concentrations of groundwater in the two local aquifers are variable by up to an order of magnitude. It should be noted that the depth (>50 m) and high salinity (>25,000 mg/L TDS) of the local groundwater prevent it from being consumed, thus not posing a health hazard to people or fauna. There are no third party groundwater bores within 50 km of the operation.

Monitoring associated with seepage from the base of the existing TSF and recent analysis shows that the contaminants (the radionuclides and the metals in the seepage) are precipitated within a few metres of the base. This is due to the neutralising effect of the underlying sediments on the acid seepage.

In 2008, the range and average radionuclide concentrations in monitored groundwater was as follows:

- ^{238}U 1.6 to 4.8 (average 2.5) Bq/l;
- ^{226}Ra 0.04 to 1.32 (average 0.7) Bq/l.

3.3.5.7 Radionuclides in surface water

There is no naturally occurring permanent free standing surface water in the region of Olympic Dam, however, after rainfall, claypans hold runoff water and are sampled opportunistically. Results from these samples have been highly variable.

3.4 Process overview

(MC 2.8.2(a))

3.4.1 Existing operation (MC 2.8.2(c))

The existing operations at Olympic Dam comprise an underground mine, surface quarrying, a mineral processing plant and associated infrastructure located within the SML area of approximately 180 square kilometres (km^2).

Access to the underground mine is through the vertical Whenan and Clark shafts, and inclined service tunnels.

The ore minerals consist mainly of fine-grained copper sulphide, uranium, gold, silver and rare earths, hosted in a haematite-rich breccia complex, located beneath about 350 m of unmineralised sedimentary rocks. The primary extraction method is a variant of sublevel (underground) open stoping, in which blocks of mineralised ore are systematically blasted and the ore recovered for crushing below ground. The crushed ore is then hoisted up one of the shafts to the surface stockpile.

Following extraction, stopes are backfilled with a cemented aggregate of crushed mullock (waste rock) or crushed dolomite/limestone sourced from a surface backfill quarry (and potentially from open-pit operations), deslimed process tailings, cement and pulverised fuel ash from the Port Augusta Power Station. Over 30 raise bores are used to ventilate the underground workings.

The surface backfill quarry operation, within the Backfill Quarry Reserve (334.53 ha), was redesigned in March 2011 to include a sump, a 500 m blasting offset distance to the TSF and a revised staged approach to quarrying. The revised approach increases the tonnages quarried to 103 million tonnes of limestone over the remaining four stages.

Above ground, the processing facilities (collectively referred to as the metallurgical plant) comprise a copper concentrator (including two primary grinding mills), hydrometallurgical plant, uranium calciners, a copper smelter, sulphuric acid plant, copper refinery, and gold and silver refinery. A simplified ore processing flow diagram for current operations is provided in Figure 3.2.

Copper is recovered primarily by flotation of copper sulphide from a slurry of finely crushed ore, after which the copper concentrate is smelted to produce blister copper, and is converted by electrorefining to high-purity copper. Wastes generated during electrorefining are treated to recover gold and silver. After treatment by flotation, the flotation tails are leached with sulphuric acid to dissolve the uranium and any remaining copper. The leach liquor is then processed in the solvent extraction plant to separate the residual copper and uranium streams. This residual copper is recovered by electrowinning, and the uranium is converted to ammonium diuranate (yellowcake), which is calcined to produce a uranium oxide concentrate (UOC).

The mining and processing operations produce a series of waste streams, which are managed in separate dedicated facilities. These include a storage facility for the tailings solids, evaporation ponds for tailings liquor, a disposal pond for mine drainage water, a rock storage facility (RSF) for any open pit overburden, a recycling centre and solids landfill, and sewage treatment facilities. The plant also includes comprehensive air pollution control equipment. Airborne emissions are monitored and managed with the aim of keeping them within statutory limits, and minimising **environmental impact**.

The current operation produces approximately 10 Mtpa of tailings containing low levels of radioactivity which is disposed of in the existing tailings storage facility (TSF) cells.

The RSF is expected to initially contain sand, unconsolidated clay and weathered materials. Removal of sands and unconsolidated clays from the open pit area has commenced, but it is not expected that any further open pit excavation activities will occur during the period of this EPMP.

A small amount of **low-level radioactive waste** is produced by the on-site analytical laboratory and the uranium product packaging area (<10 cubic metres per year (m^3/y)) and this currently has approval to be disposed of in the TSF.

Spillages of radioactive process material are generally reclaimed and recycled through the processing circuit. Where this is not possible, the spilt material is disposed of in the TSF.

Figure 3.3 shows the location of the existing Olympic Dam Operation with the Expansion components.

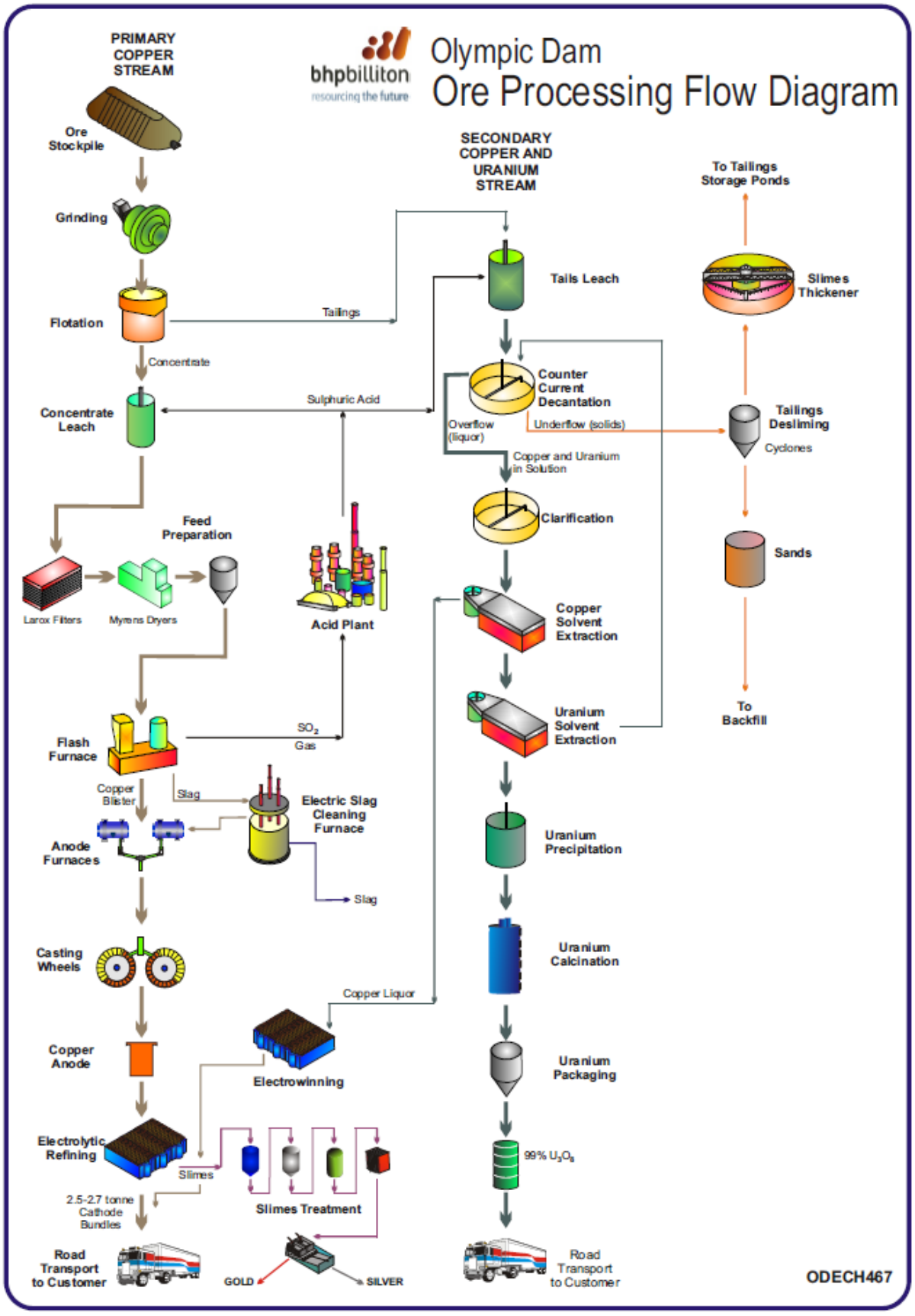

Figure 3.2: Simplified Ore Processing Flow Diagram for the Existing Operation

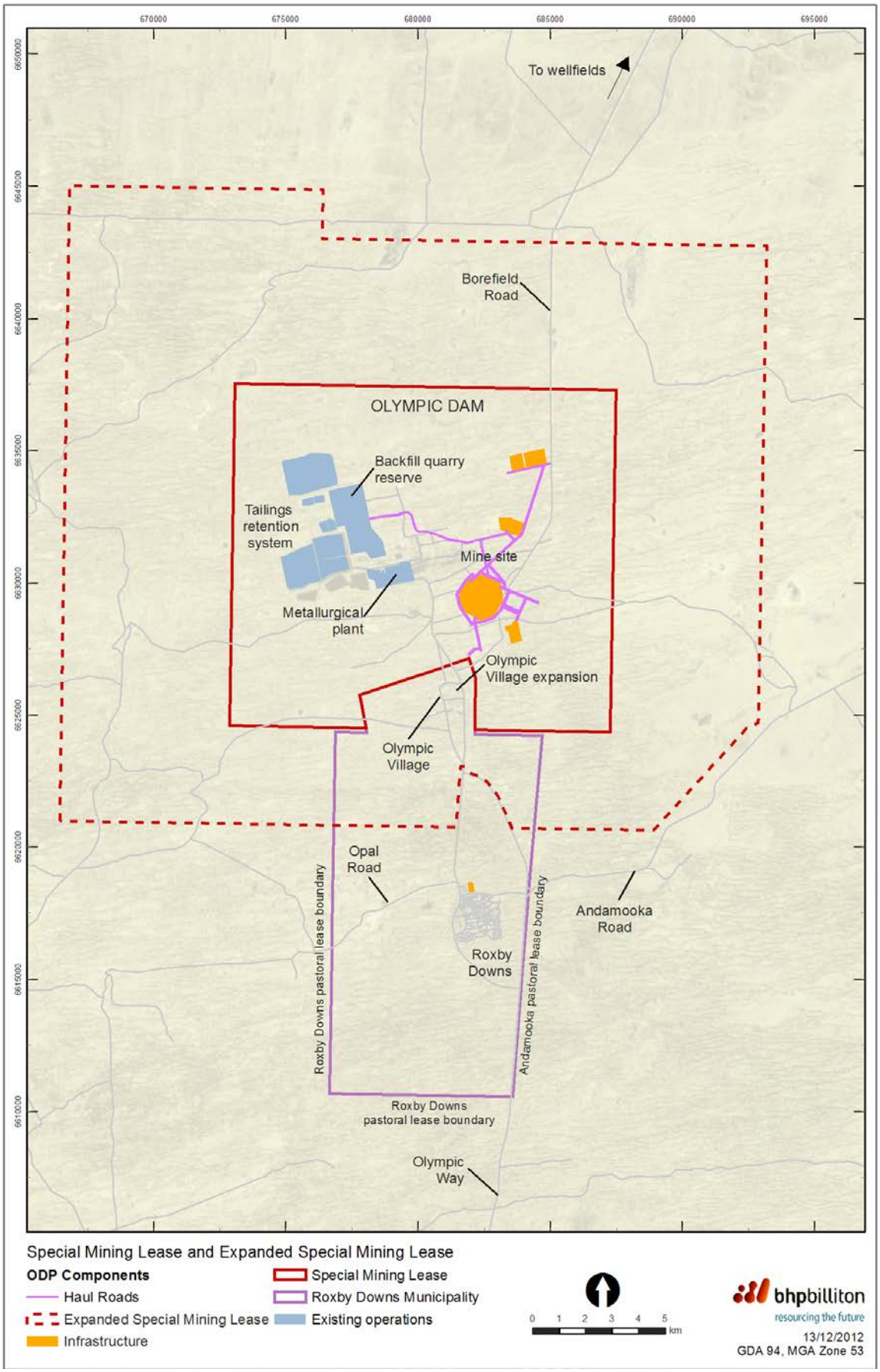

Figure 3.3: Olympic Dam Operation and Expansion

3.4.2 Approved expansion

The approved expansion of Olympic Dam incorporates the construction of an open pit, together with an increased capacity to process minerals and additional infrastructure to support the expanded operation. The SML area will increase to 590 km^2 (see Figure 3.4). In August 2012 a decision was taken to place the majority of the components of the approved expansion on hold whilst more cost effective mining and processing technologies are explored.

The components of the approved expansion that have commenced include the open pit, initial construction of an associated waste rock storage facility and continuation of dewatering activities around the open pit area (Aus 5a; State 17a). It is not expected that any further open pit excavation activities or deposition of waste into the RSF will occur during the period of this EPMP. However, in the event that further activity does occur, the EPMP contains appropriate outcomes, criteria and controls and management actions.

3.5 Environmental management system overview

(State 17h)

3.5.1 ODC Environmental Management System

The overall structure of the ODC EMS and hierarchy of documents is illustrated in Figure 3.4. The scope of the EPMP is defined within the central, orange portion of the diagram.

Within BHP Billiton, the management of environment and community is guided by the *BHP Billiton Charter* and Group Level Documents (GLDs). The GLDs cover the entire lifecycle of operations, from exploration and planning through to operation and closure (decommissioning, remediation and rehabilitation).

The relevant objectives of the GLDs are to:

- support the implementation of the Charter and the Guide to Business Conduct across BHP Billiton;
- provide a risk-based environment and community (EC) management system framework, consistent with:
    - BHP Billiton Risk Management Policy;
    - international policies, standards and management practices to which BHP Billiton has committed, including the:
        - United Nations Global Compact;
        - United Nations Universal Declaration of Human Rights;
        - International Council on Mining and Metals (ICMM) Sustainable Development Framework;
        - World Bank Operational Directive on Involuntary Resettlement;
        - US-UK Voluntary Principles on Security and Human Rights;
        - recommendations of the International Commission on Radiological Protection (specifically the system of dose limitation);
        - negotiated agreements with local communities;
        - other regional commitments;
- set out and formalise the expectations for progressive development and implementation of more specific and detailed EC management systems at all levels of BHP Billiton;
- provide auditable criteria, against which EC management systems across BHP Billiton can be measured;
- drive continual improvement towards leading industry practice.

Guided by the Charter and GLDs, the EMS (and EPMP) at Olympic Dam are implemented through a four-tiered approach. These consist of an overarching policy (in the form of the sustainable development commitment), followed by the standards and procedures (the EMM, EM Program and

MPs) that together make up the EPMP. Further information about specific elements of the EMS is given in section 3.5.2.

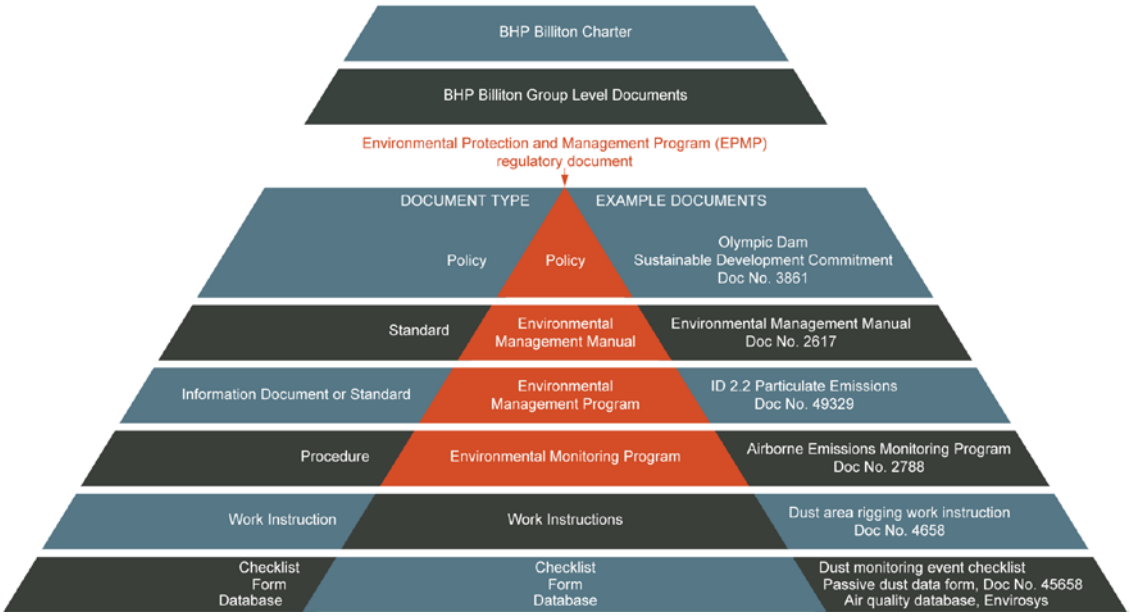

Figure 3.4: EMS and hierarchy of documents

3.5.2 ISO 14001 - Environmental Management System

This EMM provides an overview of the EMS at Olympic Dam and provides guidance and reference to the specific components of the EMS required to be followed and implemented.

Figure 3.5 outlines the components of the EMS as per ISO 14001:2004. The EMS structure consists of 17 elements, which are utilised as headings within this document to describe the activities and processes which Olympic Dam implements to meet the requirements of ISO 14001:2004. Appendix D illustrates ISO 14001 elements and subsequent key Olympic Dam documentation.

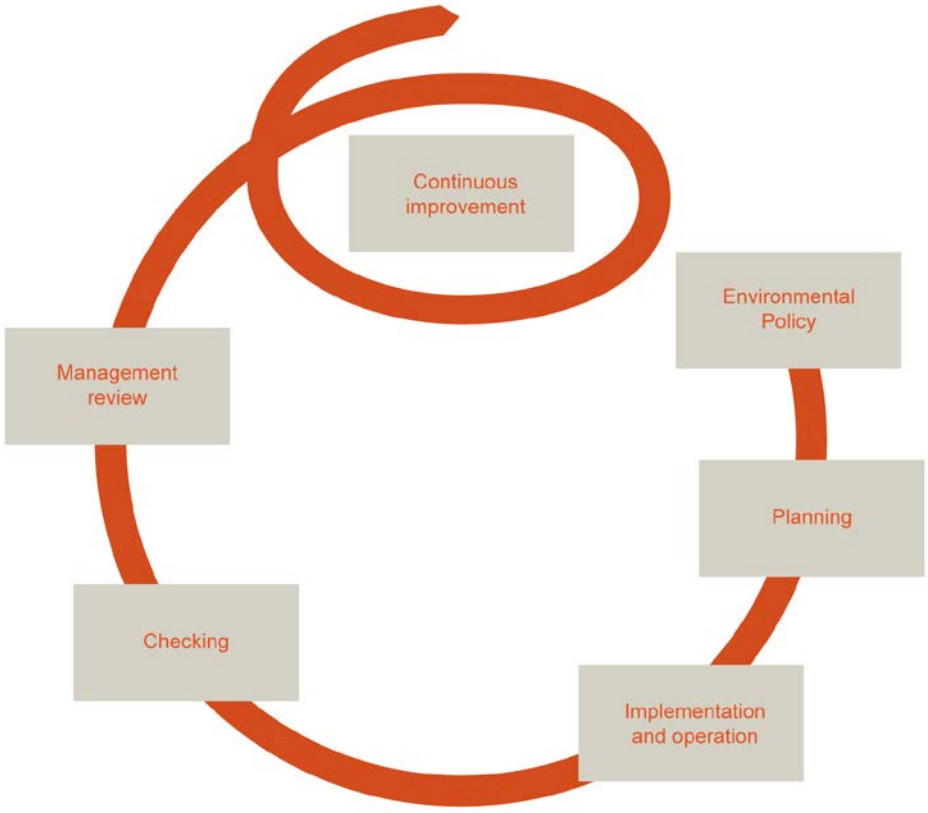

Figure 3.5: EMS Model

Figure 3.6 summarises the process by which the EM Program, MPs and Environmental Improvement Plans (EIPs) are developed. Where appropriate, these activities illustrate the corresponding ISO 14001:2004 element numbers.

The Interested Parties and Obligations Registers are maintained and used as input to the Environmental Risk Register (**aspects and impacts**). This is then used to focus on those **environmental aspects** which have the greatest risk of causing **environmental impact**, through a process of risk assessment and prioritisation of environmental issues.

The assessment of risk is standardised in accordance with the BHP Billiton Risk Management GLD (GLD.017), using a risk rating methodology. The methodology is a structured and consistent approach to risk management, aligning strategy, processes, people, technology and knowledge for the purpose of evaluating and managing the uncertainties faced in creating shareholder value.

The process of producing a prioritised list of **environmental risks** (**aspects and impacts**) is carried out annually, and is followed by the development or review of outcomes, criteria and targets (see section 2.4), and the EM Programs (see section 4.3.4). The prioritised list is used to establish the scope of the EM Program and to ensure there is a documented process for managing the prioritised risks. Other identified but un-prioritised risks can be managed by standard systems.

Where significant **aspects and impacts** are deemed to have inadequate operational or management control, or where controls are being implemented over longer timeframes, continuous improvement and development opportunities and one-year action plans and **improvement targets** are identified and detailed within the EM Programs. The detailed resources, timeframes and responsibilities for each of the items in the action plan are incorporated into area Environmental Improvement Plans (EIPs) (see section 4.5.2). These EIPs are site-based documents.

MPs (see section 4.5.1) relevant to assessing the performance of the EM Programs, control mechanisms and legal and other requirements are also reviewed annually. Other monitoring procedures are reviewed as required by the site's document management system.

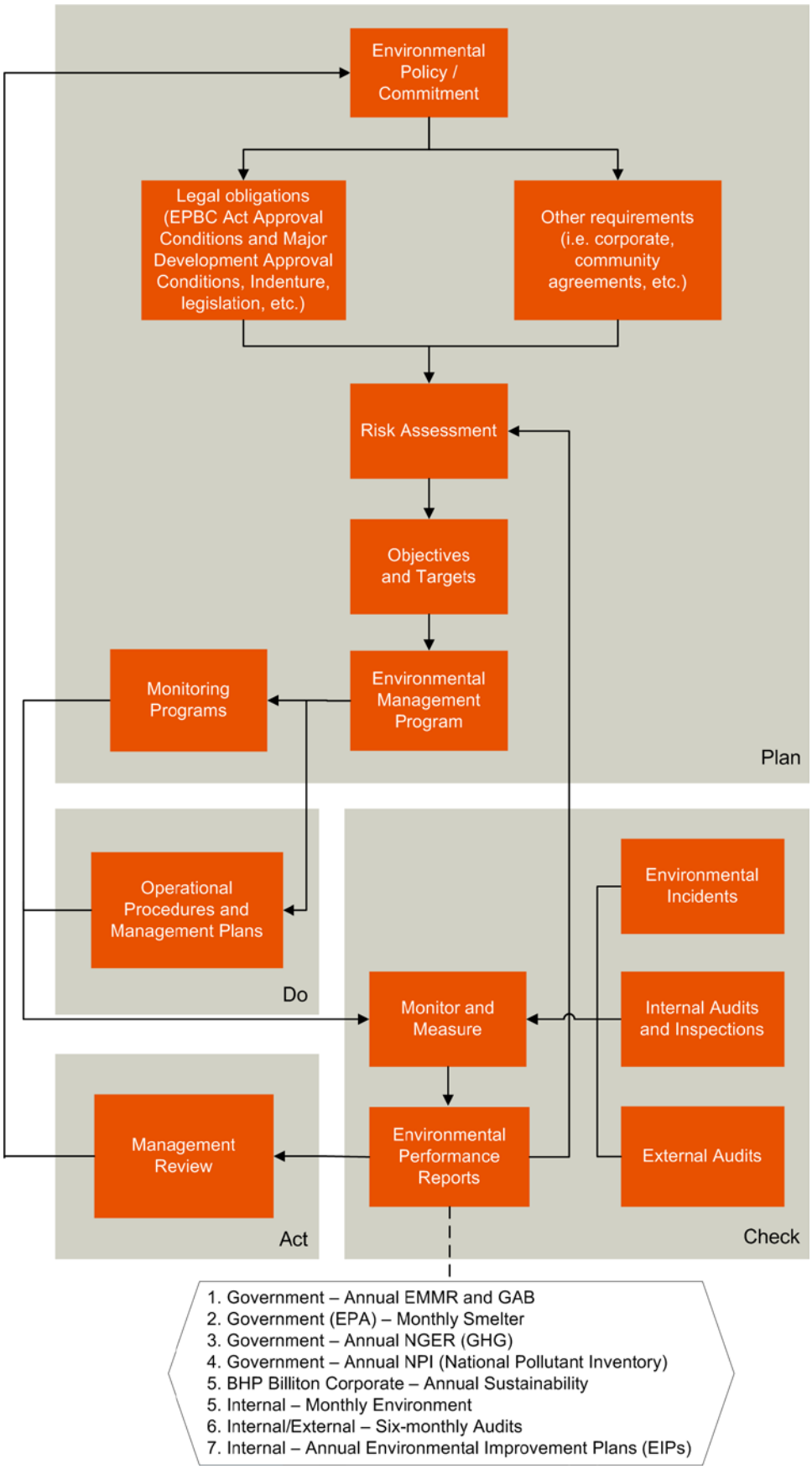

Figure 3.6: Olympic Dam EMS Model

4 ENVIRONMENTAL MANAGEMENT SYSTEM REQUIREMENTS

(State 17h)

4.1 General requirements

Elements of the Olympic Dam EMS are described in the following sections.

4.2 Policy

Olympic Dam has a site Sustainable Development Commitment, Document No. 3861, which reinforces Management's commitment to the environment. This commitment is displayed at key locations and is accessible to all employees via the intranet.

4.3 Planning

4.3.1 Environmental aspects and impacts

ODC has a procedure for the identification and prioritisation of **environmental risks** (**aspects and impacts**) related to its activities (refer to Identification and Prioritisation of Environmental Risks – Document No. 2763). The significant **environmental risks** (**aspects and impacts**) are recorded in the Olympic Dam Environmental Risk Register.

Major reviews of the Environmental Risk Register are carried out prior to major review of the EPMP. Other reviews of the register are undertaken outside this schedule to identify changes in risk that may have occurred (typically annually). Annual reviews take into account such changes as new plant and equipment, monitoring results and the performance of controls (environmental performance). If changes are required they are incorporated into the reviewed EPMP document and submitted for approval through an amendment application to government.

Identification, management and communication with contractors that undertake on-site activities that may pose an HSEC risk are detailed in the site HSEC Risk Management procedure – Document No. 36253 and the Site Specific Information & Conditions for Contractors – Document No. 53074.

4.3.2 Legal and other obligations

Legal and other obligations are taken into consideration when identifying and prioritising significant **environmental aspects and impacts**, preceding the development of the EPMP (described in section 2). Non-compliances are recorded, addressed and managed through a corporate incident tracking system (ITS). Where incidents that may potentially be required to be reported externally occur, they are managed in accordance with a site procedure (External Reporting of Environmental Incidents – Document No. 3913) and HSEC Management Standards.

4.3.3 Site environmental outcomes and targets

A comprehensive review of site **environmental outcomes** and targets is conducted during the review of the EPMP and minor reviews are conducted annually. Outcomes and **compliance criteria** are set as described in section 2.4 of this manual. Targets are formulated for departments/functions appropriate to the significant aspect and included in the EM Program, with performance reported in the annual EMMR.

The EPMP is distributed internally to those levels and functions within the site that are responsible for the outcomes, targets, management controls, continuous improvement opportunities and action plans.

4.3.4 EM Program and EM Program IDs

Significant **environmental impacts** that have been identified through the Environmental Risk Register, or through legal requirements, are addressed by the EM Program and its EM Program IDs. Continuous Improvement Opportunities are identified in the EM Programs and are progressed during the period to which the EM Program ID relates.

The EM Program documents the processes, systems and actions used to manage prioritised **aspects and impacts**, including the incorporation of:

- the **environmental values** that may be impacted, and the key risks to those **values**;
- the **environmental outcomes** that BHP Billiton aims to achieve;
- clear, specific and measurable **compliance criteria** that demonstrate achievement of the outcome(s);
- **leading indicator(s)** criteria, proving early warning of trends that indicate a **compliance criteria** may not be met;
- the management and operational controls in place to deal with the **environmental risk** (**aspects and impacts**), including any regulatory conditions;
- contingency options to be used in the event that identified risks are realised;
- continuous improvement opportunities and development opportunities identified that can assist in meeting **compliance criteria** and **environmental outcomes**;
- environmental **improvement targets** and the action plan to achieve such targets.

4.4 Implementation and operation

(MC 2.10.1(d), 2.10.1(f), 2.10.1(l), 2.10.1(m))

4.4.1 Structure and responsibility

ODC commits to providing resources that are specifically required to fulfil the commitments in the EPMP.

The Head of HSEC and the Manager Environment are appropriately qualified and resourced and are the management representatives responsible for ensuring that the EMS requirements are established, implemented and maintained in accordance with ISO 14001:2004 and the BHP Billiton HSEC Management Standards.

The Manager Environment is responsible for reporting on the performance of the EMS to the Leadership Team at the Management Review.

4.4.1.1 Organisational structure

The organisational structure for ODC, including the Environment Section, is detailed in organisation charts which are available via the BHP Billiton intranet.

Responsibilities and authorities for elements of the site EMS, as defined in this document, are detailed in Appendix F.

4.4.1.2 Responsibility for all employees

It is the responsibility of all employees to comply with the BHP Billiton HSEC Management Standards and the site EMS.

All employees must ensure that ODC's environmental obligations in relation to Olympic Dam are met by:

- understanding the **environmental risks** and obligations associated with all work to be undertaken;
- understanding and applying the relevant standards, procedures, work instructions, safeguards and controls needed to meet environmental obligations and workplace control;
- reporting actual and potential environmental incidents;
- understanding, promoting and helping to implement the Olympic Dam Sustainable Development Commitment.

4.4.1.3 Responsibility for supervisors

Supervisors will enable Olympic Dam to meet all relevant environmental obligations by ensuring that:

- employees understand the environmental hazards and obligations associated with the work they undertake;

- standards, procedures, work instructions, safeguards and other controls relating to **environmental aspects** are understood by employees and are actively applied;
- environmental incidents are reported and investigated;
- employees have HSEC objectives, and their performance against these objectives are assessed.

Supervisors also need to ensure that all activities within their area of responsibility comply with all relevant:

- legal obligations (including legislation and licence conditions);
- BHP Billiton Group Level Documents (GLDs);
- HSEC Management Standards and site HSEC Standards;
- procedures and work instructions.

Where a non-conformance is found, supervisors are required to take appropriate corrective action.

4.4.1.4 Responsibilities for Olympic Dam Leadership Team

The Asset President, Head of Departments and General Managers are responsible for:

- development and review of the Olympic Dam Sustainable Development Commitment;
- communication and application of BHP Billiton Corporate GLDs and HSEC policies across the site;
- provision of adequate human and financial resources to implement the site EMS, as outlined in this document, and implement Continuous Improvement Opportunities, as detailed in the EM Program;
- provision of resources to implement the site action plans;
- ensuring line management is responsible and accountable for environmental performance within their respective areas of responsibility;
- reviewing performance of the site EMS through the Quarterly Environmental Management Review process;
- development of annual HSEC performance targets for the site.

4.4.2 Training, awareness and competence

The processes used to develop, record and evaluate environmental training at Olympic Dam are outlined in a procedure entitled Management of Environmental Training – Document No. 39499.

4.4.3 Communication

4.4.3.1 Internal communication

Internal communication on environmental matters occurs through:

- inductions (site and area-specific);
- internal newsletters and bulletins*;*
- environmental reports/updates;
- intranet webpage;
- site safety (HSEC) meetings;
- management meetings;
- monthly, quarterly and annual reporting;
- general daily communications.

The EPA specifies in relation to Licences and Exemptions the requirements for correct display of the Licences and Exemptions, and where copies are to be made available at the site. It is also a condition of the Licences and Exemptions that employees, agents or contractors responsible for carrying out tasks are advised as to the requirements of the applicable Licence or Exemption, and the general

environment duty under section 25 of the **Environment Protection Act**. The relevant conditions of the EPA Licences and Exemptions to this effect are:

- **EPA 1301**, 400-336 and 400-215
- **EPA 3014**, 500-441 and 500-5
- EPA 31543, 500-5 and 500-437
- EPA 3054, 400-339 and 400-215

4.4.3.2 External communication

A site procedure (Environmental Reporting to External Agencies – Document No. 2681) details Olympic Dam's external environmental performance reporting requirements.

External communication on environmental matters may take the following forms:

- written (letters, memos, faxes, reports, meeting minutes, media statements);
- electronic (email, internet, video);
- verbal (either direct through meetings, presentations and media interviews, or by telephone).

All official correspondence relating to environmental management to and from regulatory agencies etc. is filed electronically in the Correspondence Register Database and archived in accordance with Environmental Records Management – Document No. 2697.

It is the responsibility of line management to ensure that copies of outgoing correspondence regarding environmental issues are forwarded to the Administrator Environment and Community for filing.

Environmental complaints are received and entered into the ITS in accordance with the site procedure Managing Environmental Complaints and Enquiries – Document No. 46600.

4.4.3.3 Interested parties register

All external enquiries from interested third parties regarding environmental issues at Olympic Dam must be directed initially to the Community Affairs Section or delegate.

A stakeholder register of interested parties is maintained for those individuals or groups that have demonstrated an interest in the environmental performance of Olympic Dam. The concerns of interested parties are considered in the risk assessment process.

Olympic Dam reviews communication strategies regularly.

4.4.4 Environmental Management System documentation

ODC has a documented Environmental Management System Index – Document No. 3785 for Olympic Dam, which provides direction to site documentation appropriate to elements of ISO 14001:2004.

All Olympic Dam documents can be accessed through the Quality System on the intranet.

The EPMP forms a portion of the EMS documentation, as described in section 3.5.1 above. The EPMP consists of a number of documents. A brief summary of each document, and reference to further information, is detailed in Table 1.1 in section 1.2.1 above.

4.4.5 Document control

The document control requirements of ISO 14001:2004 are met by the Quality System at Olympic Dam. Application of a procedure entitled Document Management Process – Document No. 1 ensures that documents are controlled and that the following occurs:

- a master list is used to identify the current version of documents;
- documents are reviewed for adequacy by authorised personnel at the required frequency prior to use;
- current issues of documents are available at locations required and are also available on the intranet;
- obsolete documents are removed from all points of issue or use, and those retained for legal knowledge preservation purposes are suitably identified as such;
- changes to documents are reviewed and approved by authorised personnel only.

4.4.6 Operational control

ODC identifies activities and services for Olympic Dam which are associated with significant **environmental risks** (**aspects and impacts**). These activities are controlled by engineering control mechanisms (e.g. baghouses), or by the development of procedures that stipulate operating criteria. Engineering controls and operating procedures relevant to the control of significant **environmental risks** are listed in the EM Program and EM Program IDs. The performance of engineering control measures is maintained through regular preventive maintenance programs.

The development and implementation of control measures is an ongoing process and is part of the continuous improvement in environmental management of the operation.

4.4.6.1 Contractor management

Environmental responsibilities and requirements are communicated to contractors working at Olympic Dam via the site Induction Process. In addition, depending on their proposed work areas, area-specific inductions also need to be attended, which include area-specific environmental responsibilities and requirements.

Contractor requests, contract specification, classification, tender process and evaluation processes are detailed in the site HSEC Risk Management procedure – Document No. 36253 and the Site Specific Information & Conditions for Contractors – Document No. 53074.

Contractors that have significant HSEC risk are required to submit an HSEC Management Plan for ODC approval. Upon approval, this plan is to be implemented and maintained.

Meetings are held with new contractors before any work begins. The Olympic Dam Contract Manager is responsible for arranging and chairing these meetings. Contractors are made aware of relevant site procedures at the meetings in addition to how to report incidents/hazards etc.

Day-to-day management of the contractor and monitoring of HSEC performance are the responsibility of the Olympic Dam Contract Manager.

4.4.6.2 Purchasing / Supply

ODC implements a Material Master Data Cataloguing Request (MM06) – Document No. 104257 for Olympic Dam, with clearances required by site personnel for dangerous/hazardous goods.

4.4.6.3 Change management

The purpose of the document, Management of Change Process – Document No. 3287 is to:

- define the process and responsibilities associated with the management of change as applied to plant, equipment, processes, services and materials;
- ensure that changes are implemented in a systematic and traceable manner;
- ensure change does not compromise the safety and health of the personnel, the environment, production and the operation of the plant.

Roles and responsibilities are defined for personnel within each department within their Position Descriptions.

Change management also encapsulates certain conditions within the various EPA Licences and Exemptions associated with change as applied to plant, equipment, processes, services and materials. Change management also captures process issues associated with the Licences and Exemptions such as the annual return process, the renewal of licences and exemptions, and the ability of the EPA to impose or vary conditions during the life of the licence or exemption in question. The following table summarises the Licence and Exemption and the relevant conditions as they apply to these change management facets.

Table 4.1: EPA Licence or Exemption change management

EPA Licence or Exemption	Condition number					
	Annual return process	**Change to process emissions or waste**	**Alterations to plant and equipment**	**Imposing or varying of conditions**	**Renewal**	**Change of Licensee details**
EPA 1301	400-78	400-347	400-348	400-201	320-38, 400-79	
EPA 3054	400-78	400-347	400-348	400-201	400-79	400-338
EPA 31543	500-103	500-438	500-439	500-6	500-99	500-2
EPA 3014	500-103			500-6	500-99	500-2

4.4.6.4 Emergency preparedness and response

The Olympic Dam Incident Management Team Plan – Document No. 48598 details the process to be followed in a site emergency. An Emergency Services Group is maintained to support the Olympic Dam operation. An experienced, professional team of Emergency Services Officers trained in all aspects of emergency response, including environmental incidents, provides coverage 24 hours a day. This group is supported by an Emergency Response Team comprising other employees and contractors trained in emergency response and first aid.

All incidents relating to the environment are reported through the ITS and related records are maintained.

4.5 Checking and corrective action

(MC 2.10.1(i), 2.10.1(j))

4.5.1 Monitoring and measurement

MPs are implemented to assess performance against the EM Program IDs' outcomes, **compliance criteria** and targets, control mechanisms and legal and other requirements. The results are compiled and inform submissions to government, predominantly in the following reports:

- monthly EPA Smelter Report;
- annual Environmental Management and Monitoring Report (EMMR);
- annual Great Artesian Basin (GAB) Wellfields Report.

A documented procedure (Environmental Reporting to External Agencies – Document No. 2681) provides details on required external reports, responsibilities and associated submission dates.

There are ten MPs referenced in the EM Programs and forming part of the EPMP. These are:

- Monitoring Program – Airborne Emissions – Document No. 2788;
- Monitoring Program – Energy Use and Greenhouse Gas Emissions – Document No. 67616;
- Monitoring Program – Environmental Radiation – Document No. 2790;
- Monitoring Program – Fauna – Document No. 2663;
- Monitoring Program – Flora – Document No. 2664;
- Monitoring Program – Great Artesian Basin (GAB) – Document No. 2789;
- Monitoring Program – Groundwater – Document No. 2791;
- Monitoring Program – Noise and Vibration Emissions – Document No. 110685;
- Monitoring Program – Social Effects – Document No. 110687;
- Monitoring Program – Waste – Document No. 2792.

Additional monitoring procedures and work instructions are available on the Olympic Dam Document Management System (DMS). Records are filed and/or data is entered into a database(s), as directed by the associated documentation.

ODC calibrates and maintains monitoring equipment for Olympic Dam as required, and records of this process are retained.

Where monitoring indicates a significant potential impact or significant actual impact, an incident notification is raised in the ITS. The incident is assessed to determine the BHP Billiton level of significance and the requirements for reporting to regulators and other stakeholders. This information is also considered in the annual review of **environmental aspects and impacts**.

Implementation, data analysis and reporting of data relating to MPs, procedures and work instructions are a mechanism for the periodic evaluation of compliance with relevant environmental legislation and regulations.

4.5.2 Area environment improvement plans

Environmental Improvement Plans (EIPs) are developed by Environment Section and Operations personnel for each area to evaluate performance of ODC against outcomes, **compliance criteria** and targets. They are also used to set action plans that designate actions, responsibilities and timeframes to achieve the **environmental outcomes** and targets. These EIPs are revised regularly to reflect changes in organisational objectives and operational targets.

4.5.3 Non-conformance and corrective and preventative action

(MC 2.10.1(h))

Incidents are managed in accordance with the procedure External Reporting of Environmental Incidents – Document No. 3913. All incidents are recorded in the ITS.

Documented procedures exist covering non-conformances with standards or systems and legislation, licences or commitments (refer to procedures listed in Appendices B and C). Corrective and preventative actions taken are appropriate to the magnitude and risk of the actual or potential problem.

Where any corrective and preventative action results in changes to how an activity is performed, appropriate changes are made to existing documented procedures or work instructions.

Non-conformance with the EMS (based on ISO 14001:2004) identified by audits (termed critical actions) and the associated corrective and preventative actions, as well as non-compliance with environmental legislation, licences and/or obligations are entered into the ITS.

Environmental reports and updates are generated by Environment Section personnel and circulated to relevant site personnel. An Environment Report is produced for each operational area: Mine, Processing, Smelter and Refinery and Non-Process Infrastructure. Details of non-conformances are included in these documents. Relevant information on incidents, non-conformances and corrective and preventative action is also included in these reports and is submitted for management review of the EMS.

4.5.4 Records

(MC 2.10.1(n))

Identification, maintenance and disposal of records are consistent with procedures established for both the Quality and the Environmental Management Systems. Environmental records management is described by the Environmental Records Management procedure – Document No. 2697.

Retention periods are in accordance with records management procedures and will vary according to customer, statutory and Olympic Dam requirements.

All archived records are required to be clear and legible and maintained in an environment suitable for long-term storage without degradation and in a manner that allows for ready retrieval and use.

4.5.5 Environmental audit(s)

ODC has a documented audit procedure for HSE Management System Audits at Olympic Dam – Document No. 32101. The timing and frequency of audits at Olympic Dam are identified and managed by site. The results of audits are recorded and brought to the attention of personnel directly responsible for the area being audited.

Integration of auditing across the site is required to enhance efficiencies. A dedicated Internal Auditor at Olympic Dam facilitates and investigates opportunities to integrate Quality, Environment and Safety Management System audits. HSEC Group Level Documents and associated Standards are organised through Olympic Dam's Head of HSEC and Standard Champions.

Other audits that may be performed on a less frequent basis include:

- environmental compliance audits (i.e. internal or external audit focusing on legal/regulatory matters);
- verification audits;
- radiation protection audits (i.e. internal or external audits as determined by the regulator (MC 2.10.1(k)).

The Manager Environment provides a quarterly update to the Olympic Dam Leadership Team at the Management Review Meeting, detailing audits completed for the quarter, non-conformances and audit recommendations identified, and progress against non-conformances and audit recommendations from previous audits.

4.6 Management review

Olympic Dam's Leadership Team reviews the EMS at defined intervals to ensure its continuing suitability, adequacy and effectiveness. The management review of the **Environmental Management System** document – Document No. 46385 ensures that these objectives are achieved. This document includes a description of the contents of these reviews.

Each year, the operation undertakes an 'adequacy and effectiveness' review of radiation protection mechanisms (MC 2.8.2(i)) which is reported in the annual LM1 Report.

A record of all management reviews is maintained.

5 GLOSSARY

Term	Definition
Amendment Act	Roxby Downs (Indenture Ratification) (Amendment of Indenture) Amendment Act 2011 (SA).
Amended Indenture	The Indenture scheduled to the Amendment Act (as amended from time to time).
Arid Recovery	A joint conservation initiative between ODC, the local community, the South Australian Department for Environment & Natural Resources and The University of Adelaide. Based at Roxby Downs, the initiative aims to develop and implement methods for broad-scale restoration of arid lands.
Aspects and Impacts	ODC's procedure for the identification and prioritisation of environmental risks.
Best Practicable Technology	The use of that technology which produces the maximum environmental benefit that can be reasonably achieved having regard to all matters including: • the environmental standards achieved by uranium operations elsewhere in the world and the extent to which environmental degradation is prevented; • the level of environmental protection to be achieved by the application or adoption of the technology and the resources required to apply or adopt the technology so as to achieve the maximum environmental benefit from the available resources; • the cost of the technology; • evidence of detriment, or lack of detriment, to the environment; • the physical location of the Olympic Dam Mine; • the age of equipment and facilities in use at Olympic Dam Mine and their relative effectiveness in reducing environmental pollution and degradation; • the extent to which the technology provides for continuous improvement; • social factors including the views of the regional community and possible adverse effects of introducing alternative technology.
Clause 11 Program	Three year program for the protection, management and rehabilitation (if appropriate) of the environment, submitted to and approved by, the Minister in accordance with Clause 11 of the Indenture (as amended from time to time).
Compliance Criteria	Measurable standards or specifications of parameters to demonstrate achievement of a required outcome.
Designated Area	The area designated in respect of a **Special Water Licence** in accordance with clause 13(8) of the Indenture.
Dose Constraint	Given meaning from the Code of Practice for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (ARPANSA 2005, or as amended).
Environment	Surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation.
Environmental Aspect	Element of the organization's activities, products or services that can interact with the environment.
Environmental Impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.

Term	Definition
Environmental Management Manual	Document that describes the scope of the Environmental Management System, its main elements and their interaction, and reference to related documents.
Environmental Protection and Management Program	The compilation of documents including the Environmental Management Manual, Environmental Management Program, Monitoring Programs and Mine Closure and Rehabilitation Plan.
Environmental Management System	Part of ODC's management systems used to develop and implement its environmental policy and manage its environmental aspects. The core elements of the EMS are described in the Environmental Management Manual. Note 1: A management system is a set of interrelated elements used to establish policy and objectives and to achieve those objectives. Note 2: A management system includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources.
Environmental Outcome	Overall environmental goal, consistent with the environmental policy that an organisation sets itself to achieve. Is an outcome based commitment on the extent to which the operation will seek to limit impacts on the environment (natural, social and economic). These are intended to be reasonable and realistically achievable, acceptable to affected parties and meet other applicable legislative requirements. Outcomes are accompanied by compliance criteria, which represent confirmation that the outcome has been achieved (defined further in section 2.4 of the Environmental Management Manual).
Environment Protection Act	Environment Protection Act 1993 (SA)
Environmental Risk	The chance of something happening that will have an impact on environmental outcomes
Environmental Values	Physical characteristics and qualities of the environment that contribute to biodiversity conservation, and the social, spiritual and economic health of individuals and society.
EPA Exemption 3014	Exempts ODC from certain conditions of the Environment Protection (Air Quality) Policy 1994, allowing prescribed activities in abnormal or emergency situations to be conducted.
EPA Licence 1301	EPA Licence 1301, under the Environment Protection Act**,** governs permissible procedures and protocols, emission or concentration levels, as well as operation and/or maintenance standards of plant and equipment by ODC at Olympic Dam.
EPBC Act Approval Conditions	Conditions of the environmental approval for the expansion of the Olympic Dam copper, uranium, gold and silver mine and processing plant, including all associated infrastructure, which was granted on 10 October 2011 by the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities, under sections 130(1) and 133 of the EPBC Act in response to referral 2005/2270.
EPBC Act Program	Environmental protection management program in relation to Mining and Processing, submitted to and approved by the relevant Minister in accordance with Condition 4 of the EPBC Act Approval Conditions.
Expansion	Expansion of the Olympic Dam Mine as described in the DEIS and SEIS.
Expanded SML	The Special Mining Lease held by ODC as expanded in accordance with clause 19(1B) of the Amended Indenture.
Indenture	The Indenture scheduled to the Ratification Act (as amended from time to time).

Term	Definition
Important population of a species	A population that is necessary for a species' long-term survival and recovery. This may include populations identified in recovery plans as key source populations, either for breeding or dispersal, populations that are necessary for maintaining genetic diversity and/or populations that are near the limit of the species range.
Improvement Target	Target applied to the planned delivery of continual improvement opportunities.
Leading Indicator (Criteria)	Measurable standards or specifications of parameters that give an early warning that a control measure is failing and a required outcome is potentially at risk of not being achieved.
Licence LM1	Licence granted on 28 September 1988 under the *Radiation Protection and Control Act 1982* (SA) to mine and treat uranium bearing ores at Olympic Dam.
Listed Species or Ecological Communities	Those species or communities that are listed as threatened or migratory under Commonwealth and/or relevant State or Territory legislation.
Low-Level Radioactive Waste	Waste that is above exemption levels, but with limited amounts of long-lived radionuclides.
Major Development Approval	Development authorisation for the Proposed Major Development, granted by the Indenture Minister pursuant to the *Development Act 1993* (SA) and the Ratification Act, by notice in the South Australian Government Gazette dated 10 October 2011 (as amended from time to time).
Major Development Approval Conditions	Conditions of Major Development Approval.
Management Plan	A document that either contains or provides references to information that is required to manage an *environmental aspect*. It may cover multiple aspects, multiple entities or be contained within a broader business plan. These documents are not approved or regulated by Government.
Material environmental harm	As defined in the Environment Protection Act, section 5(3)(a).
Members of the Public	Meaning given in IAEA Safety Glossary – Terminology used in nuclear safety and radiation protection (international Atomic Energy Agency 2007, or as amended).
Mining Code	Code of Practice for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing 2005 (ARPANSA).
Mitigation Plan	A plan to manage or mitigate an adverse environmental impact or detriment and, where applicable, for a return to compliance with the relevant provision of the EPMP (including where appropriate, timeframes, monitoring and reporting).
Monitoring Program	A program, identified in an EM Program and forming part of the EPMP, that documents the process to collect and interpret data used to assess the performance of the EM Program IDs' outcomes, criteria, controls, management actions, legal obligations and other requirements. The results from these MPs are compiled and inform submissions to Government in various reports.
National Greenhouse and Energy Reporting Act 2007	The *National Greenhouse and Energy Reporting Act 2007* (the Act) was passed on 29 September 2007 establishing a mandatory reporting system for corporate greenhouse gas emissions and energy production and consumption. The first reporting period under the Act commenced on 1 July 2008.
Non-human biota	Plants and animals (other than humans).

Term	Definition
Olympic Dam Agreement	An agreement dated 15 January 2008 between BHP Billiton and key traditional owner groups affected by the Olympic Dam mine and its expansion. Those groups include the Kokatha people, the Barngarla people, and the Kuyani people.
Organisation	Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration.
Policy/Commitment	Direction of ODC related to its performance in Health, Safety, Environment and Community (HSEC). It provides a framework for action and for the setting of environmental outcomes and targets.
Project Approval	Has the meaning given to that term in the Amended Indenture (essentially any approval required by ODC for a project under the Indenture).
Proposed Major Development	The components of the expansion of Olympic Dam that are approved by the Major Development Approval.
Radioactive	A material defined as a radioactive ore or radioactive substance in the Radiation Protection and Control Act 1982 (SA).
Reference plants and animals	Plants and animals defined by the ICRP for the purposes of non-human biota dose assessment.
Ratification Act	Roxby Downs (Indenture Ratification) Act 1982 (SA).
Significant adverse impact to populations	An impact to a population that results in impairing the ability of populations to recover and/or replace themselves.
Significant impact	Represents an environmental aspect with a potential to cause environmental impact, as determined by a risk assessment.
Significant Impact Guidelines	EPBC Act Policy Statement 1.1, Significant Impact Guidelines – Matters of National Environmental Significance (Department of the Environment, Water, Heritage and the Arts 2009).
Special Mining Lease	Special Mining Lease granted under the Indenture and held by ODC.
Special Water Licence	A Special Water Licence granted under the Indenture. (Two have been issued to ODC for extraction of water from the Great Artesian Basin (GAB)).
Substantial Commencement	The stripping of topsoil from the open pit site and commencement of removal of overburden.
Target	Targets reflect long-term aspirational goals that ODC expects to achieve, an interim target leading to a long-term goal, or shorter term performance targets.
Target Criteria	For the EPBC Act Approval Conditions: • Measurable standards or specifications of parameters that reflect a level of impact that is as low as reasonably achievable or minimised to the lowest reasonable levels for non-human biota. Practices must be reviewed if criteria are exceeded. For the Major Development Approval Conditions and **Clause 11 Program**: • Reflecting a level of impact that is as low as reasonably achievable.
Value	Description of specific environmental values that a particular EM Program ID is aiming to protect.

5.1 Acronyms

Term	Definition
ALARA	As Low As Reasonably Achievable
AHD	Australian Height Datum
BPT	Best Practicable Technology
DEIS	Olympic Dam Expansion Draft Environmental Impact Statement 2009
DMITRE	Department for Manufacturing, Innovation, Trade, Resources and Energy (South Australia)
EIS	Final Environmental Impact Statement, incorporating the Draft Environmental Impact Statement 2009 and the Supplementary Environmental Impact Statement 2011
EMM	Environmental Management Manual
EMMR	Environmental Management and Monitoring Report
EM Program	Environmental Management Program
EMS	Environmental Management System
EPA	Environment Protection Authority (South Australia)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
EPMP	Environmental Protection and Management Program
EPP	EPP (2003) – Environment Protection (Water Quality) Policy 2003
GGEMP	Greenhouse Gas and Energy Management Plan
HIA	Heavy Industrial Estate or Heavy Industrial Area
LLRW	Low-Level Radioactive Waste
MC	Mining Code
MCRP	Mine Closure and Rehabilitation Plan
MP	Monitoring Program
NEPM	NEPM (1999) - National Environment Protection (Assessment of Site Contamination) Measure, National Environment Protection Council, December 1999
NGER	National Greenhouse and Energy Reporting
ODC	BHP Billiton Olympic Dam Corporation Pty Ltd
ODP	Olympic Dam Projects: responsible for the expansion of Olympic Dam and related activities
ODV1	Olympic Village
RSF	Rock Storage Facility
RWMP	Radioactive Waste Management Plan
SEIS	Olympic Dam Expansion Supplementary Environmental Impact Statement 2011
SML	Special Mining Lease held by ODC
TRS	Tailings Retention System
TSF	Tailings Storage Facility

6 REFERENCES

ARPANSA 2005, Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (ARPANSA 2005).

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Government of South Australia, PIRSA, Minerals Regulatory Guidelines MG2, Guidelines for miners: preparation of a mining lease proposal or mining and rehabilitation program (MARP) in South Australia, Version 4.9, February 2009.

Standards Australia, 2004, AS/NZS ISO14001:2004: Environmental Management Systems – Requirements with guidance for use.

Standards Australia, 2004, AS/NZS ISO14001:2004: Environmental Management Systems – Guidelines on principles, systems and support techniques.

7 APPENDIX A: GOVERNMENT CONDITIONS CROSS-REFERENCES

7.1 Appendix A1: Australian Government conditions cross-references

Table 7.1: Australian Government conditions and EPMP cross-references

Australian Government condition number	Environmental Management Manual	Environmental Management Program																	Monitoring Programs									
		ID 1.1 Land disturbance and rehabilitation	ID 1.2 Spread of pest plants and animals	ID 1.3 Aquifer level drawdown	ID 2.1 Chemical/Hydrocarbon spills	ID 2.2 Radioactive process material spills	ID 3.1 Particulate emissions	ID 3.2 Noise and vibration emissions	ID 3.3 Sulphur dioxide emissions	ID 3.4 Saline aerosol emissions	ID 3.5 Radioactive emissions	ID 3.6 Greenhouse gas emissions	ID 4.1 Embankment stability of TSF	ID 4.2 Waste rock containment and seepage	ID 4.3 Tailings seepage	ID 4.4 Fauna interaction	ID 4.5 Solid waste disposal	ID 4.6 Radioactive waste	ID 5.1 Community interactions	Fauna	Flora	Great Artesian Basin	Groundwater	Airborne emissions	Noise and vibration emissions	Environmental radiation	Energy use and GHG emissions	Waste	Social effects
5a	1.1 3.4.2			1.3.2	2.1.2	2.2.2					3.5.2				4.3.2	4.4.2		4.6.2		1	1	1	1.1			1			
5bi						2.2.12					3.5.3 3.5.12 3.5.13							4.6.3 4.6.12 4.6.13											
5bii					2.1.3 2.1.12 2.1.13	2.2.3 2.2.12 2.2.13																							
5biii																4.4.3 4.4.12												
5biv				1.3.3 1.3.12 1.3.13											4.3.3 4.3.12 4.3.13														
5c				1.3.7	2.1.7	2.2.7					3.5.7				4.3.7	4.4.7		4.6.7											
5d	2.5.2			1.3.8	2.1.8	2.2.8					3.5.8				4.3.8			4.6.8											
5e	2.5.2				2.1.9	2.2.9									4.3.9														
5f	2.4.2.2 2.5.2										3.5.9					4.4.16		4.6.9											
5g																				2.1.3 2.2.3 2.3.3 2.4.3 2.5.3 2.6.3 2.7.3	2.1.3 2.2.3 2.3.3 2.4.3 2.5.3 2.6.3 2.7.3 2.8.2	2.1.4 2.2.4 2.3.4 2.4.4	2.1.4 2.2.4 2.3.4 2.4.4 2.5.1			2.2.4 2.3.4 2.4.4		2.1.3 2.2.3	
5h																				2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4 2.8.4	2.1.4 2.2.4 2.3.4 2.4.4 5 8	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 5			2.2.4 2.3.4 2.4.4		2.1.4 2.2.4	
5i																				2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4 2.8.4	2.1.4 2.2.4 2.3.4 2.4.4 8	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 5			2.2.4 2.3.4 2.4.4		2.1.4 2.2.4	
5j																				2.2.1 2.5.1 2.5.4 2.7.4	2.2.1 2.5.4	2	2			2.2.4 2.3.4 2.4.4			
5k				1.3.3 1.3.12 1.3.13	2.1.3 2.1.12	2.2.3 2.2.12					3.5.3 3.5.12 3.5.13				4.3.3 4.3.12	4.4.3 4.4.12		4.6.3 4.6.12		2.6.3									

Australian Government condition number	Environmental Management Manual	Environmental Management Program																		Monitoring Programs									
		ID 1.1 Land disturbance and rehabilitation	ID 1.2 Spread of pest plants and animals	ID 1.3 Aquifer level drawdown	ID 2.1 Chemical/Hydrocarbon spills	ID 2.2 Radioactive process material spills	ID 3.1 Particulate emissions	ID 3.2 Noise and vibration emissions	ID 3.3 Sulphur dioxide emissions	ID 3.4 Saline aerosol emissions	ID 3.5 Radioactive emissions	ID 3.6 Greenhouse gas emissions	ID 4.1 Embankment stability of TSF	ID 4.2 Waste rock containment and seepage	ID 4.3 Tailings seepage	ID 4.4 Fauna interaction	ID 4.5 Solid waste disposal	ID 4.6 Radioactive waste	ID 5.1 Community interactions	Fauna	Flora	Great Artesian Basin	Groundwater	Airborne emissions	Noise and vibration emissions	Environmental radiation	Energy use and GHG emissions	Waste	Social effects
6						2.2.8					3.5.8 3.5.9				4.3.8			4.6.8 4.6.9											
10	2.3																												
10a	2.3																												
10b	2.2 2.3																												
10c	2.3																												
10d	2.3																												
10e	2.3																												
10f	2.3																												
10g	2.3																												
10h	2.3																												
10i	2.3																												
10j	2.3																												
10k	2.3																												
13						2.2.7 2.2.8					3.5.7 3.5.8							4.6.7 4.6.8							2.2.2			
14	2.4.2.2										3.5.9							4.6.9											
15						2.2.3					3.5.3 3.5.12. 3							4.6.3 4.6.12. 1											
16					2.1.7 2.1.8	2.2.3 2.2.7 2.2.8																								
17					2.1.9	2.2.9																								
18																4.4.7 4.4.12													
19																4.4.3													
20	2.4.2.2															4.4.16											2.1.2 2.2.2		
22a				1.3.7																									
22b				1.3.7																									
22c															4.3.7														
23a				1.3.12 1.3.14																		3.2							
23b				1.3.14																		3.2							
23c				1.3.14																		3.2							
23d				1.3.14																		3.2							
24a				1.3.8																									
24b				1.3.8																									
24c															4.3.8														
25															4.3.9														
26															4.3.7 4.3.8														
27				1.3.7																									
28a				1.3.8																									
28b				1.3.11																			2.1.4 2.2.4 2.3.4 2.4.4							
28c				1.3.13																									
28d																							2						
29a		1.1.12																		2.5.2 2.6.3 2.6.4	2.6.2 2.7.3 2.7.4								

Australian Government condition number	Environmental Management Manual	Environmental Management Program																		Monitoring Programs									
		ID 1.1 Land disturbance and rehabilitation	ID 1.2 Spread of pest plants and animals	ID 1.3 Aquifer level drawdown	ID 2.1 Chemical/Hydrocarbon spills	ID 2.2 Radioactive process material spills	ID 3.1 Particulate emissions	ID 3.2 Noise and vibration emissions	ID 3.3 Sulphur dioxide emissions	ID 3.4 Saline aerosol emissions	ID 3.5 Radioactive emissions	ID 3.6 Greenhouse gas emissions	ID 4.1 Embankment stability of TSF	ID 4.2 Waste rock containment and seepage	ID 4.3 Tailings seepage	ID 4.4 Fauna interaction	ID 4.5 Solid waste disposal	ID 4.6 Radioactive waste	ID 5.1 Community interactions	Fauna	Flora	Great Artesian Basin	Groundwater	Airborne emissions	Noise and vibration emissions	Environmental radiation	Energy use and GHG emissions	Waste	Social effects
29b			1.2.7																	2.3.2 2.3.3	2.4.2 2.4.3								
29c						2.2.3					3.5.3							4.6.3											
30	2.1.2 2.2																												
82																					2.3.1								
82a		1.1.11 1.1.16																			2.3.1								
82b		1.1.12																			2.8.1								
82bi		1.1.12																											
82bii		1.1.12																											
82biii		1.1.12																											
82biv		1.1.12																											
82c		1.1.12																			2.8.1								
82d		1.1.12																											
82e		1.1.12																											
82f		1.1.12																											
82g		1.1.12																											
82h		1.1.12																											
82i		1.1.12																											
82j		1.1.12																			2.8.1								
82k		1.1.11 1.1.12																			2.8.3								
82l																					2.8.3								
99	2.2																												
104a	2.5.2																												
104b	2.5.2																												
104c	2.5.2																												
105	2.5.2																												
Total	**28**	**18**	**1**	**22**	**12**	**19**	**0**	**0**	**0**	**0**	**18**	**0**	**0**	**0**	**15**	**11**	**0**	**17**	**0**	**32**	**39**	**22**	**23**	**0**	**0**	**14**	**0**	**8**	**0**

The following Australian Government conditions have been omitted from Table 7.1 as they are administrative requirements that do not relate to an environmental management activity relevant to the EPMP:

1–4, 7–9, 11–12, 31, 33–38, 81, 83–98, 100–103, 106, 107–109

The following Australian Government conditions have been omitted from Table 7.1 as they refer to elements of the project that are out of scope for the approved expansion within the next two years, or are not yet required as per the condition wording:

21, 32, 39–60, 61–62, 63, 64–68, 69–80

7.2 Appendix A2: South Australian Government conditions cross-references

Table 7.2: South Australian Government Conditions and EPMP cross-references

South Australian Government Condition Number	Environmental Management Manual	Environmental Management Program																		Monitoring Programs									
		ID 1.1 Land disturbance and rehabilitation	ID 1.2 Spread of pest plants and animals	ID 1.3 Aquifer level drawdown	ID 2.1 Chemical/Hydrocarbon spills	ID 2.2 Radioactive process material spills	ID 3.1 Particulate emissions	ID 3.2 Noise and vibration emissions	ID 3.3 Sulphur dioxide emissions	ID 3.4 Saline aerosol emissions	ID 3.5 Radioactive emissions	ID 3.6 Greenhouse gas emissions	ID 4.1 Embankment stability of TSF	ID 4.2 Waste rock containment and seepage	ID 4.3 Tailings seepage	ID 4.4 Fauna interaction	ID 4.5 Solid waste disposal	ID 4.6 Radioactive waste	ID 5.1 Community interactions	Fauna	Flora	Great Artesian Basin	Groundwater	Airborne emissions	Noise and vibration emissions	Environmental radiation	Energy use and GHG emissions	Waste	Social effects
4		1.1.8 1.1.12																			2.3.2								
6		1.1.12																		2.6.4	2.6.2 2.7.4								
7		1.1.12																		2.5.2 2.6.3 2.7.2									
8																				2.6.1 7									
9																				2.3.2	2.4.2								
11												3.6.10																	
11a												3.6.8 3.6.10																	
11b												3.6.15 3.6.16															2.2.4		
11ci												3.6.3 3.6.10															2.2.4		
11cii												3.6.3 3.6.10																	
13																											2.1.4 2.2.3		
13a																											2.1.4 2.2.4		
13b																											2.1.4 2.2.4		
14																													
14a																			5.1.16									2.4.1 2.4.3
14b																			5.1.12.5									2.4.1
14c																			5.1.11									2.4.1 2.4.3
14d																			5.1.3 5.1.11									2.5.1
14e																			5.1.11 5.1.14									2.5.1
14f																			5.1.11 5.1.12.2 5.1.14									2.2.1 2.3.1
14g																			5.1.11									2.5.4
14h																			5.1.12									2.1.4
14i																			5.1.3 5.1.12									2.1.3 2.1.4
15																			5.1.2 5.1.12.6									1
16																			5.1.2 5.1.12.6									1
17a	1.1 3.4.2	1.1.2	1.2.2	1.3.2	2.1.2	2.2.2	3.1.2	3.2.2	3.3.2	3.4.2	3.5.2	3.6.2	4.1.2	4.2.2	4.3.2	4.4.2	4.5.2	4.6.2	5.1.2	1	1	1	1.1	1	1	1	1	1	1
17b		1.1.7	1.2.7	1.3.7	2.1.7	2.2.7	3.1.7	3.2.7	3.3.7	3.4.7	3.5.7	3.6.7	4.1.7	4.2.7	4.3.7	4.4.7	4.5.7	4.6.7	5.1.7										
17c		1.1.8	1.2.8	1.3.8	2.1.8	2.2.8	3.1.8	3.2.8	3.3.8	3.4.8	3.5.8	3.6.8	4.1.8	4.2.8	4.3.8	4.4.8	4.5.8	4.6.8	5.1.8										

South Australian Government Condition Number	Environmental Management Manual	Environmental Management Program																	Monitoring Programs									
		ID 1.1 Land disturbance and rehabilitation	ID 1.2 Spread of pest plants and animals	ID 1.3 Aquifer level drawdown	ID 2.1 Chemical/Hydrocarbon spills	ID 2.2 Radioactive process material spills	ID 3.1 Particulate emissions	ID 3.2 Noise and vibration emissions	ID 3.3 Sulphur dioxide emissions	ID 3.4 Saline aerosol emissions	ID 3.5 Radioactive emissions	ID 3.6 Greenhouse gas emissions	ID 4.1 Embankment stability of TSF	ID 4.2 Waste rock containment and seepage	ID 4.3 Tailings seepage	ID 4.4 Fauna interaction	ID 4.5 Solid waste disposal	ID 4.6 Radioactive waste	ID 5.1 Community interactions	Fauna	Flora	Great Artesian Basin	Groundwater	Airborne emissions	Noise and vibration emissions	Environmental radiation	Energy use and GHG emissions	Waste	Social effects
17d		1.1.9	1.2.9	1.3.9	2.1.9	2.2.9	3.1.9	3.2.9	3.3.9	3.4.9	3.5.9	3.6.9	4.1.9	4.2.9	4.3.9	4.4.9	4.5.9	4.6.9	5.1.9										
17e	2.4.2										3.5.16							4.6.16										
17g	2.4	1.1.12	1.2.12	1.3.3 1.3.12 1.3.13	2.1.12	2.2.3 2.2.12	3.1.3 3.1.12 3.1.13 3.1.14 3.1.15	3.2.3 3.2.12 3.2.13 3.2.14 3.2.15	3.3.3 3.3.12	3.4.3 3.4.12	3.5.11 3.5.12 3.5.13 3.5.14	3.6.3 3.6.12 3.6.13 3.6.14 3.6.15	4.1.12	4.2.12 4.2.15	4.3.3	4.4.12	4.5.3 4.5.12 4.5.13 4.5.14 4.5.15	4.6.11 4.6.12 4.6.13 4.6.14	5.1.12										
17h	2.4 3.5 4																											
17i	2.5.1																											
17j																												
17ki						2.1.8	2.2.8						4.1.8							2.1.3 2.2.3 2.3.3 2.4.3 2.5.2 2.5.3 2.6.3 2.7.3	2.1.3 2.2.3 2.3.3 2.4.3 2.5.3 2.6.3 2.7.3 2.8.2	2.2.4 2.3.4 2.4.4 2.5.4	2.1.4 2.2.4 2.3.4 2.4.4 2.5.1	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4 3.2	2.4 3.2	2.2.4 2.3.4 2.4.4	2.1.4 2.2.4 3.2	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4 2.8.4 3.2	2.1.3 2.2.3 2.3.3 2.4.3 2.5.3
17kii						2.1.8	2.2.8						4.1.8							2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4	2.1.4 2.2.4 2.3.4 2.4.3 2.4.4 2.5.4 2.6.4 2.7.4	2.2.4 2.3.4 2.4.4 2.5.4 5 8	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 5	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4	2.4	2.2.4 2.3.4 2.4.4	2.1.4	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4 2.8.4	2.1.3 2.2.3 2.3.3 2.4.3 2.5.3
17kiii		1.1.8	1.2.8	1.3.8	2.1.8	2.2.8	3.1.8	3.2.8	3.3.8	3.4.8	3.5.8	3.6.8	4.1.8	4.2.8	4.3.8	4.4.8	4.5.8	4.6.8	5.1.8										
17kiv					2.1.8	2.2.8							4.1.8							2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4	2.2.4 2.3.4 2.4.4 8	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 5	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4 3.2	2.4	2.2.4 2.3.4 2.4.4	2.1.4 3.2	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4 2.8.4 3.2	2.1.3 2.2.3 2.3.3 2.4.3 2.5.3
17kv																				2.2.1 2.5.1 2.5.4 2.7.4	2.1.1 2.2.1 2.5.4	2	2	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4	2.4	2.2.4 2.3.4 2.4.4	2.1.4	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4 2.6.4 2.7.4 2.8.4	2.1.4 2.2.4 2.3.4 2.4.4 2.5.4
18	2.2																											
23								3.2.8																2.3				
24					2.1.12																							
25					2.1.12																							
26				1.3.12 1.3.14																			3.2					
26 a				1.3.14																			3.2					
26b				1.3.14																			3.2					
26c				1.3.14																			3.2					
26d				1.3.14																			3.2					

South Australian Government Condition Number	Environmental Management Manual	Environmental Management Program																		Monitoring Programs									
		ID 1.1 Land disturbance and rehabilitation	ID 1.2 Spread of pest plants and animals	ID 1.3 Aquifer level drawdown	ID 2.1 Chemical/Hydrocarbon spills	ID 2.2 Radioactive process material spills	ID 3.1 Particulate emissions	ID 3.2 Noise and vibration emissions	ID 3.3 Sulphur dioxide emissions	ID 3.4 Saline aerosol emissions	ID 3.5 Radioactive emissions	ID 3.6 Greenhouse gas emissions	ID 4.1 Embankment stability of TSF	ID 4.2 Waste rock containment and seepage	ID 4.3 Tailings seepage	ID 4.4 Fauna interaction	ID 4.5 Solid waste disposal	ID 4.6 Radioactive waste	ID 5.1 Community interactions	Fauna	Flora	Great Artesian Basin	Groundwater	Airborne emissions	Noise and vibration emissions	Environmental radiation	Energy use and GHG emissions	Waste	Social effects
27				1.3.13																									
28				1.3.11																									
28a																						2.2.4 2.3.4 2.4.4	2.1.4 2.2.4 2.3.4 2.4.4						
30																							1.1 1.3						
32														4.2.7 4.2.8	4.3.7 4.3.8														
34	2.4.2					2.2.3					3.5.3 3.5.4 3.5.7 3.5.8 3.5.9 3.5.12.3							4.6.3 4.6.4 4.6.7 4.6.8 4.6.9 4.6.12.1													
38																				2.6.4	2.7.4								
48							3.1.10																	1.3					
48a							3.1.10																						
48c							3.1.11																	1.3					
49a							3.1.8																						
50a							3.1.12																	2.7.4					
50b																								2.7.4					
50c																								2.7.4					
50d																								2.7.4					
50e																								2.7.4					
50f																									2.2.4				
109								3.2.8																	2.3				
112			1.2.12																										
121								3.2.8																	2.3				
127								3.2.8																	2.3				
Total	**10**	**10**	**7**	**16**	**11**	**11**	**15**	**14**	**7**	**7**	**16**	**19**	**9**	**9**	**8**	**6**	**10**	**16**	**23**	**35**	**32**	**19**	**31**	**38**	**10**	**14**	**16**	**35**	**35**

The following South Australian Government conditions have been omitted from Table 7.2 as they are administrative requirements that do not relate to an environmental management activity relevant to the EPMP:

1–2, 12, 17j, 19, 20–22, 29, 36-37, 43–44, 52, 110, 114-115, 122, 128–129, 133–134

The following South Australian Government conditions have been omitted from Table 7.2 as they refer to elements of the project that are out of scope for the approved expansion within the next two years, or are not yet required as per the condition wording:

10, 31, 35, 40-42, 46–47, 48b, 49b–c, 50g-i, 53–57, 58, 59–88, 89–107, 108, 110-111, 113, 116–118, 120, 123-125, 126, 130-132, 135–151, 152-157

The following South Australian Government conditions have been omitted from Table 7.2 as the requirements are to be submitted independently of the EPMP:

5

The following South Australian Government conditions have been omitted from Table 7.2 as the requirements have been completed independently of the EPMP:

33, 39, 51

8 APPENDIX B: MINING CODE REQUIREMENTS

ODC maintains an integrated EMS that describes the approach and systems for management of all **environmental aspects** associated with the operation, including radiological impacts to **members of the public**, the environment and non-human biota.

Notwithstanding the specific **EPBC Act Approval Conditions** and **Major Development Approval Conditions** (in the form of company commitments and licence conditions), there is a requirement in South Australia under the Radiation Protection and Control Act for the operation to hold a Licence to Mine and Mill Radioactive Ores. As part of this licence, ODC must comply with the Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (also known as the **Mining Code**).

Given the extent of the broader environmental requirements at Olympic Dam, and the fact that radiological parameters are usually considered with other non-radiological parameters, the specifics of the **Mining Code** requirements have been incorporated into the site-wide Environmental Protection Management Program (EPMP).

Table 8.1 cross-references the specific requirements of the **Mining Code** to where they are addressed in the broader EPMP.

Table 8.1: Mining Code and EPMP cross-references

			Environmental Management Program																				Monitoring Programs										
Mining Code clause number	Information Only	Environmental Management Manual	ID 1.1 Land disturbance and rehabilitation	ID 1.2 Spread of pest plants and animals	ID 1.3 Aquifer level drawdown	ID 2.1 Chemical/Hydrocarbon spills	ID 2.2 Radioactive process material spills	ID 3.1 Particulate emissions	ID 3.2 Noise and vibration emissions	ID 3.3 Sulphur dioxide emissions	ID 3.4 Saline aerosol emissions	ID 3.5 Radioactive emissions	ID 3.6 Greenhouse gas emissions	ID 4.1 Embankment Stability of TSF	ID 4.2 Waste rock containment and seepage	ID 4.3 Tailings seepage	ID 4.4 Fauna interaction	ID 4.5 Solid waste disposal	ID 4.6 Radioactive waste	ID 5.1 Community interactions	Fauna	Flora	Great Artesian Basin	Groundwater	Airborne emissions	Noise and vibration	Environmental radiation	Energy use and GHG emissions	Waste	Social
1.1	X																															
1.2	X																															
1.3	X																															
1.4	X																															
2.1	X																															
2.2	X																															
2.3.1		1.1.5																														
2.3.2	X																															
2.3.3	X																															
2.3.4		1.1.5																														
2.3.5	X																															
2.4	X																															
2.5	X																															
2.6	X																															
2.7	RMP																															
2.8.1		1.1.5 2.1.4																														
2.8.2(a)		3.4																														
2.8.2(b)		3.3 3.3.5																														
2.8.2(c)		3.4.1											3.5.12		4.1.2 4.1.3 4.1.12	4.2.2 4.2.3 4.2.12	4.3.2 4.3.3 4.3.12			4.6.2 4.6.3 4.6.12												

Mining Code clause number	Information Only	Environmental Management Manual	Environmental Management Program																		Monitoring Programs									
			ID 1.1 Land disturbance and rehabilitation	ID 1.2 Spread of pest plants and animals	ID 1.3 Aquifer level drawdown	ID 2.1 Chemical/Hydrocarbon spills	ID 2.2 Radioactive process material spills	ID 3.1 Particulate emissions	ID 3.2 Noise and vibration emissions	ID 3.3 Sulphur dioxide emissions	ID 3.4 Saline aerosol emissions	ID 3.5 Radioactive emissions	ID 3.6 Greenhouse gas emissions	ID 4.1 Embankment Stability of TSF	ID 4.2 Waste rock containment and seepage	ID 4.3 Tailings seepage	ID 4.4 Fauna interaction	ID 4.5 Solid waste disposal	ID 4.6 Radioactive waste	ID 5.1 Community interactions	Fauna	Flora	Great Artesian Basin	Groundwater	Airborne emissions	Noise and vibration	Environmental radiation	Energy use and GHG emissions	Waste	Social
2.8.2(d)																											1.3 1.4			
2.8.2(e)																								2.3 2.5	2.2.1 2.5.1 2.7.1		1 2.1		2.7.1	
2.8.2(f)							2.2.13									4.3.13			4.6.13										
2.8.2(g)																											3.1			
2.8.2(h)	MCRP																													
2.8.2(i)		4.6																												
2.9.1		2.1. 4																												
2.9.2		2.1. 4																												
2.9.3		2.1. 4																												
2.9.4		2.1. 4																												
2.9.5		2.1. 4																												
2.9.6		2.1. 4																												
2.9.7	X																													
2.10.1(a)	RMP																													
2.10.1(b)		2.6																												
2.10.1(c)		2.1. 4																												
2.10.1(d)		4.4																							1.1		1.1		1.1	
2.10.1(e)		2.1. 4																												
2.10.1(f)		4.4																									1.1		1.1	
2.10.1(g)		2.1. 4																												
2.10.1(h)		4.5. 3					2.2.4 2.2.12																							
2.10.1(i)		4.5					2.2.12																							
2.10.1(j)		4.5																												
2.10.1(k)		4.5. 5																												
2.10.1(l)		4.4																												
2.10.1(m)		4.4.																												
2.10.1(n) 2.10.1(o)		4.5. 4																												
	RMP																													
2.10.1(p)	RMP																													
2.10.2	RMP																													
Total		**28**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	**3**	**4**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**2**	**4**	**0**	**7**	**0**	**3**	**0**

RMP: Radiation Management Plan, outside scope of EPMP

MCRP: Mine Closure and Rehabilitation Plan

9 APPENDIX C: EPA (SA) LICENCE AND EXEMPTION CROSS-REFERENCES

Table 9.1: EPA Licence and Exemption cross-references

EPA Licence/Exemption (Condition)	Environmental Management Manual	Environmental Management Program								Monitoring Programs		
		ID 2.1 Chemical/Hydrocarbon spills	ID 3.1 Particulate emissions	ID 3.3 Sulphur dioxide emissions	ID 4.1 Embankment Stability of TSF	ID 4.3 Tailings seepage	ID 4.4 Fauna interaction	ID 4.5 Solid waste disposal	ID 5.1 Community interaction	Groundwater	Airborne emissions	Waste
EPA 1301 - Licence												
(305-137)				3.3.3							2.1.4	
(305-138)				3.3.3							2.1.4	
(305-139)				3.3.3							2.1.4	
				3.3.8							2.4.1	
											2.4.4	
(305-140)			3.1.3	3.3.3							2.1.4	
				3.3.8							2.4.1	
											2.4.4	
(305-141)				3.3.3							2.1.4	
				3.3.8							2.4.1	
											2.4.4	
(305-142)				3.3.12								
(37-43)			3.1.12	3.3.12							2.1.4	
(30-10)			3.1.12									
(330-168)		2.1.3										
		2.1.12										
(34-39)		2.1.12										
(34-70)			3.1.3									
			3.1.12									
(34-71)		2.1.12	3.1.12									
(34-72)			3.1.3									
(80-43)								4.5.12				
(80-44)								4.5.12				
(80-18)								4.5.12				

EPA Licence/Exemption (Condition)	Environmental Management Manual	Environmental Management Program								Monitoring Programs		
		ID 2.1 Chemical/Hydrocarbon spills	ID 3.1 Particulate emissions	ID 3.3 Sulphur dioxide emissions	ID 4.1 Embankment Stability of TSF	ID 4.3 Tailings seepage	ID 4.4 Fauna interaction	ID 4.5 Solid waste disposal	ID 5.1 Community interaction	Groundwater	Airborne emissions	Waste
								4.5.13				
(300-20)									5.1.12			
(330-162)			3.1.12	3.3.12								
(320-38)	4.4.6.3											
(400-336)	4.4.3.1											
(400-215)	4.4.3.1											
(400-201)	4.4.6.3											
(400-347)	4.4.6.3											
(400-348)	4.4.6.3											
(400-78)	4.4.6.3											
(400-79)	4.4.6.3											
EPA 3054 - Licence												
(315-458)								4.5.13				
(300-20)									5.1.12			
(400-338)	4.4.6.3											
(400-339)	4.4.3.1											
(400-215)	4.4.3.1											
(400-201)	4.4.6.3											
(400-347)	4.4.6.3											
(400-348)	4.4.6.3											
(400-78)	4.4.6.3											
(400-79)	4.4.6.3											
EPA 3014 - Exemption												
(500-36)			3.1.12									
(500-37)				3.3.13								
(500-39)				3.3.13							2.1.4	
(500-40)				3.3.12								
(500-441)	4.4.3.1											
(500-2)	4.4.6.3											

EPA Licence/Exemption (Condition)	Environmental Management Manual	Environmental Management Program								Monitoring Programs		
		ID 2.1 Chemical/Hydrocarbon spills	ID 3.1 Particulate emissions	ID 3.3 Sulphur dioxide emissions	ID 4.1 Embankment Stability of TSF	ID 4.3 Tailings seepage	ID 4.4 Fauna interaction	ID 4.5 Solid waste disposal	ID 5.1 Community interaction	Groundwater	Airborne emissions	Waste
(500-5)	4.4.3.1											
(500-6)	4.4.6.3											
(500-103)	4.4.6.3											
(500-99)	4.4.6.3											
EPA 31543 - Exemption												
(500-433)					4.1.12	4.3.3						2.1.3
						4.3.12	4.4.12					2.1.4
(500-434)						4.3.12						
(500-435)						4.3.11				2.1.4		2.1.3
						4.3.12						2.1.4
(500-436)						4.3.11				2.3.4		
(500-407)						4.3.13						
(500-5)	4.4.3.1											
(500-437)	4.4.3.1											
(500-2)	4.4.6.3											
(500-6)	4.4.6.3											
(500-103)	4.4.6.3											
(500-438)	4.4.6.3											
(500-439)	4.4.6.3											
(500-99)	4.4.6.3											

The following EPA conditions have been omitted from Table 9.1 as they are out of scope of the EPMP: 1301.330-248; 3014.500-8

Only EPMP documents relevant to EPA Licence and Exemptions are included in Table 9.1.

10 APPENDIX D: EM PROGRAM ID, ENVIRONMENTAL OUTCOMES, CRITERIA AND TARGETS

Cross-references to sections of the monitoring programs are provided (e.g. FA 2.6) to show where monitoring for each criteria or target is described within the respective monitoring programs.
Individual monitoring programs are referred to in this table with a two letter abbreviation as follows: Fauna – FA; Flora – FL; Great Artesian Basin – GA; Groundwater – GW; Environmental Radiation – ER; Airborne Emissions – AE; Noise and Vibration Emissions – NV; Energy Use and GHG Emissions – EG; Waste – WA; Surface water – SW; Social Effects – SE; Transport – TR.

ID	EM Program	Environmental outcome (State 17b)	Compliance criteria (State 17c, 17kiii)	Leading indicators (State 17d)	Target
ID 1 USE OF NATURAL RESOURCES					
1.1	Land disturbance and rehabilitation	• No **significant adverse impacts to populations** of **listed species** (South Australian, Commonwealth) as a result of the construction, operation and closure of Olympic Dam.	• No significant impact to the size of an **important population of** Category 1a **species** (FL 2.6). *Note: Significant impact is as defined in the **Significant Impact Guidelines** and greater than predicted in the **EIS**.* • No loss of an **important population of** Category 1b **species** (FA 2.6, FL 2.7). • Clearing of vegetation not to exceed the total area of 17,269 hectares as indicated in the **EIS** (DEIS and SEIS) (State 4) (FL 2.3).	• None applicable	• Implement an SEB offsets plan (Document No. 111271) to compensate for the clearance of vegetation and other **environmental impacts** occurring during the life of the mine, providing an offset of at least 8 ha of vegetation for every hectare cleared by the end of the project (2052), (Aus 82a). (FL 2.10).
1.2	Spread of pest plants and animals	• No significant increase in the areas of infestation or abundance of declared pest plants, plant pathogens or pest animal populations (Aus 29b).	• No significant increase (relative to control locations remote to and / or prior to operations) in abundance of pest animals (cats and foxes) on the SML that can be attributed to ODC's activities (FA 2.3). • No significant increase (relative to control locations remote to and / or prior to operations) in abundance or infestation area of declared pest plants and plant pathogens that can be attributed to ODC's activities within the SML and GAB wellfields area (FL 2.4). *Note: A significant increase is defined as the introduction of a new self sustaining population of a species, which has not previously been recorded in operational areas, or a 100 per cent increase above the 12 month rolling average in the abundance or known infestation area.*	• None applicable	• None applicable
1.3	Aquifer level drawdown	• No significant adverse impacts to existing third-party users' right to access water from within the GAB wellfield **Designated Areas** for the proper development or management of the existing use of the lands as a result of ODC activities. • No significant adverse impacts to the availability and quality of groundwater to existing Stuart Shelf third-party users as a result of groundwater drawdown associated with ODC activities. • No significant adverse impact on groundwater-dependent **listed species** or **ecological communities** as a result of groundwater drawdown associated with ODC activities (Aus 5c, 22a, 22b, 27).	• A 4 m drawdown limit at the point on the **designated area** for Wellfield A that is mid-way between GAB8 and HH2 based on the 12-month moving average (Aus 5d, 24a, 28a) (GA 2.2, GA 2.3). • A 4 m drawdown limit for Wellfield B at the point between monitoring bores S1 and S2 (measured as the average drawdown of the two bores) and based on the 12-month moving average (Aus 5d, 24a, 28a) (GA 2.2, GA 2.3). • A drawdown footprint for Wellfield B, measured as the area contained within the 10 m drawdown contour, that is less than or equal to 4,450 km^2 (Aus 5d, 24a, 28a) (GA 2.2, GA 2.3). • No significant decline in groundwater flow rate to Yarra Wurta Springs due to the operation of the Motherwell wellfield (Aus 5d, 24b) (GW 2.4). *Note: Significant decline is defined as a decline in flow that would lead to a failure of the groundwater-dependent ecosystems.* • No material change in the availability and quality of	• A drawdown trend at monitoring bore S1 that may exceed 4.5 m in the next 12 months (GA 2.2). • A drawdown footprint for Wellfield B, measured as the area contained within the 10 m drawdown contour, that is greater than 4,000 km^2 (GA 2.2). • A combination of the following factors that can be attributed to water extraction from Wellfields A and B: o Evidence that flow reductions at GAB springs in the vicinity of the wellfields may exceed the predictions made in the Olympic Dam Environmental Impact Statements of 1982 and 1997. o Evidence of water quality change (measured as pH or conductivity) at GAB springs (GA 2.1, GA 2.3). • A continuing drawdown trend at GAB pastoral bores that may exceed the predictions of the Olympic Dam Environmental Impact Statement of 1997 (GA 2.2).	• Maintain an industrial water efficiency of 1.18 kL/t at the budgeted production rate (GA 2.4). • Maintain a domestic water use target of 3.2 ML/day average (GA 2.4).

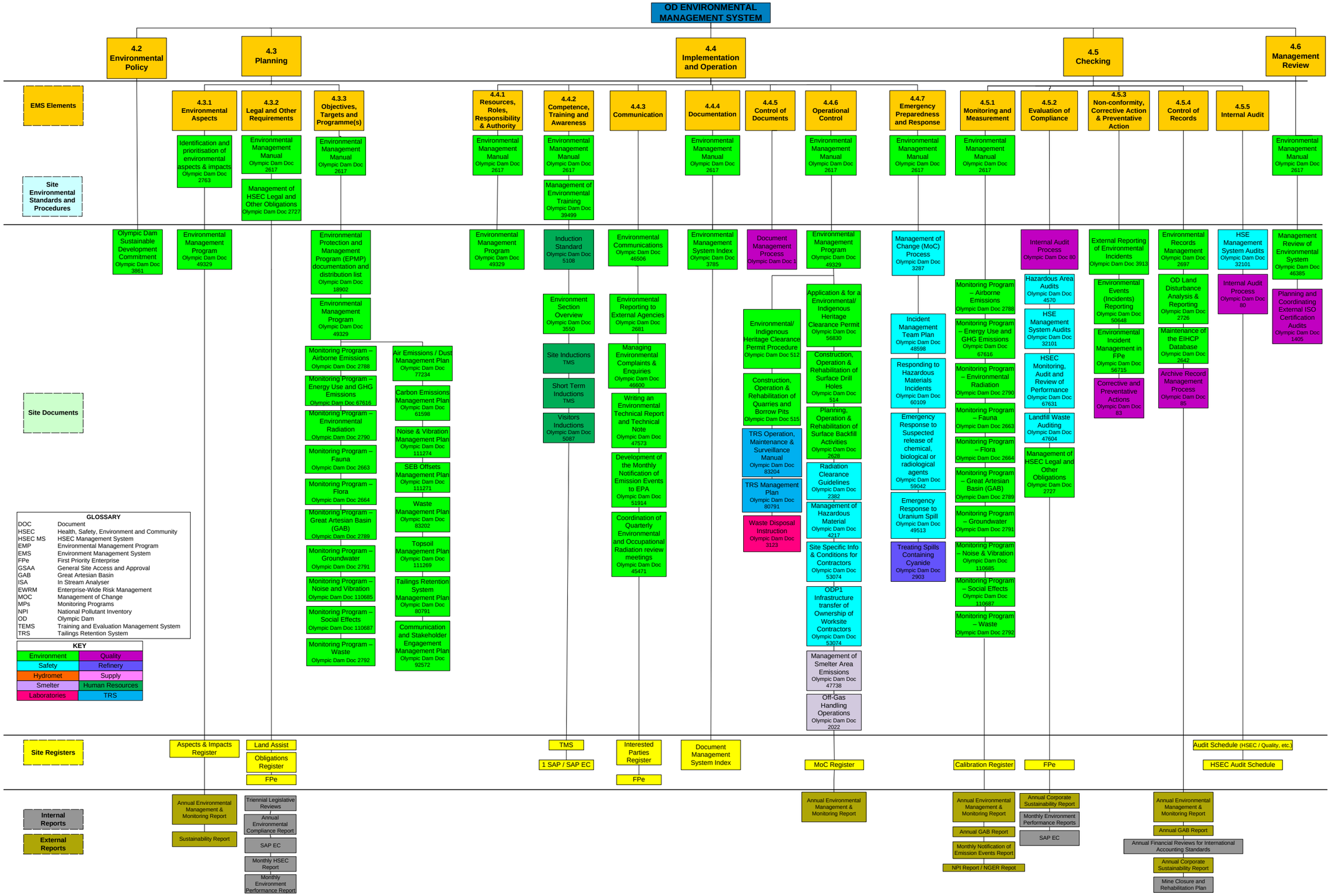
ID	EM Program	Environmental outcome (State 17b)	Compliance criteria (State 17c, 17kiii)	Leading indicators (State 17d)	Target
			groundwater at existing bores in the Stuart Shelf area operated by third-party users (GW 2.2, GW 2.3).	• A declining trend in groundwater flow rates at Yarra Wurta Springs that may lead to significant adverse impacts to groundwater-dependent ecosystems (GW 2.4). • A drawdown trend or changes in groundwater quality in the Stuart Shelf area that may impact on existing third-party users (GW 2.2, GW 2.3).	
ID 2 STORAGE, TRANSPORT AND HANDLING OF HAZARDOUS MATERIALS					
2.1	Chemical/Hydrocarbon spills	• No significant site contamination of soils, surface water or groundwater, as a result of the transport, storage or handling of hazardous substances associated with ODC's activities (Aus 5c, 16).	• No site contamination leading to **material environmental harm** arising from hydrocarbon/chemicals spills within the SML and Wellfields **Designated Areas** (Aus 5d, 16). *Note: Measurement and monitoring is carried out in response to a specific event and in accordance with the NEPM 1999 or EPP 2003, as appropriate. (State 17ki, 17kii, 17kiv)*	• Soil concentrations above NEPM investigation levels (Health Investigation Levels (HILs) for Commercial/Industrial uses (Scenario F) for metals/metalloids, organics and other substances) that indicate a likelihood of adverse effects on human health values based on a meaningful and appropriate site-specific health risk assessment (Aus 5e, 17).	• Total recordable spills of chemicals and hydrocarbons to be less than or equal to 28 events. *Note: An internally recordable spill of chemicals and/or hydrocarbons is defined as a spill of 10 litres or greater, outside of a bund, in a single event.*
2.2	Radioactive process material spills	• No adverse impacts to public health as a result of radioactive process material spills from ODC's activities (Aus 5c, 13, 16). • No **significant adverse impacts to populations** of **listed species** or **ecological communities** as a result of radioactive process material spills from ODC's activities (Aus 5c, 13, 16).	• A dose limit for radiation doses to **members of the public** of 1 mSv/y above natural background (Aus 5d, 6, 13) (ER 2.2). • No significant radioactive contamination arising from uncontrolled loss of radioactive material to the natural environment (Aus 5d, 16) (ER 2.4). *Note: Significant is defined as requiring assessment and remedial action in accordance with the NEPM 1999 or EPP 2003 and the **Mining Code.** Measurement and monitoring is carried out in response to a specific event. (State 17ki, 17kii, 17kiv)*	• Soil concentrations above NEPM investigation levels (Health Investigation Levels (HILs) for Commercial/Industrial uses (Scenario F) for metals/metalloids, organics and other substances) that indicate a likelihood of adverse effects on human health values based on a meaningful and appropriate site-specific health risk assessment (Aus 5e, 17) (ER 2.4).	• Total recordable spills of radioactive process material to be less than or equal to 52 events. • Externally reportable spills of radioactive process material to be less than or equal to 2 events (ER 2.4). *Note: Reportable spills of radioactive process material as defined by the Criteria and Procedures for Recording and Reporting Incidents at SA Uranium Mines (DMITRE), known as 'Bachmann Criteria'.*
ID 3 OPERATION OF INDUSTRIAL SYSTEMS					
3.1	Particulate emissions	• No adverse impacts to public health as a result of particulate emissions from ODC's activities.	• Ground level PM_{10} dust concentrations at Roxby Downs derived from construction and operational sources at Olympic Dam must not exceed the PM_{10} 24-hour average of 50 $\mu g/m^3$ (State 49a) (AE 2.7) • Ground level $PM_{2.5}$ dust concentrations at Roxby Downs derived from construction and operational sources at Olympic Dam must not exceed the $PM_{2.5}$ 24-hour average of 25 $\mu g/m^3$ (State 49a) (AE 2.7) • Ground level $PM_{2.5}$ dust concentrations at Roxby Downs derived from construction and operational sources at Olympic Dam must not exceed the $PM_{2.5}$ annual average of 8 $\mu g/m^3$ (State 49a) (AE 2.7)	• None applicable	• None applicable
3.2	Noise and vibration emissions	• No significant adverse impacts to public health or amenity as a result of noise and vibration emissions from ODC's activities	• Maintain noise from the operations at Olympic Dam to less than 47 dBL_{Aeq} between 7am and 10pm and 40 dBL_{Aeq} between 10pm and 7am when measured at the facade of the	• None applicable	• None applicable

ID	EM Program	Environmental outcome (State 17b)	Compliance criteria (State 17c, 17kiii)	Leading indicators (State 17d)	Target
			nearest residence at Roxby Downs, in accordance with the Environment Protection (Noise) Policy 2007 (NV 2). • Maintain vibration levels at Roxby Downs as a result of blasting activities to less than 5 mm/s for 95% of blasts, with a maximum of 10 mm/s for any one blast, in accordance with Australian Standard AS2187.2:2006 (State 23) (NV 2).		
3.3	Sulphur dioxide emissions	• No adverse impacts to public health as a result of sulphur dioxide emissions from ODC's activities.	• Annual average SO_2 concentration of less than 0.02 ppm at sensitive receivers, Olympic Village and Roxby Downs (AE 2.1, AE 2.4). • 24 hour average SO_2 concentration of less than 0.08 ppm at sensitive receivers, Olympic Village and Roxby Downs (AE 2.1, AE 2.4). • One hour average SO_2 concentration of less than 0.2 ppm at sensitive receivers, Olympic Village and Roxby Downs (AE 2.1, AE 2.4).	• None applicable	• Reduce the total EPA notifiable emission events by 5% of the FY12 target (less than 176 events) (AE 2.1, AE 2.4).
3.4	Saline aerosol emissions	• No **significant adverse impacts to populations** of **listed species** (South Australian, Commonwealth) as a result of ODC's activities.	• No loss of an **important population of** Category 1b **species** (AE 2.6).	• None applicable	• Reduce the deposition of salt from saline aerosol emissions at RB21 salt jars by 10% of the FY13 target (less than 1,179 mg/m^2/day) (AE 2.6).
3.5	Radioactive emissions	• No adverse impacts to public health as a result of radioactive emissions from ODC's activities (Aus 5c, 13; State 34). • No **significant adverse impacts to populations** of **listed species** or **ecological communities** as a result of radioactive emissions from ODC's activities (State 34).	• Radiation doses to **members of the public** less than 1mSv/y above natural background (Aus 5d, 6, 13; State 34) (ER 2.2). • Deposition of project originated ^{238}U less than 25 Bq/m^2/y at the non-human biota assessment sites (ER 2.3).	• Indications that a **dose constraint** of 0.3 mSv/y to **members of the public** above natural background will be exceeded (Aus 5f, 6, 14; State 34) (ER 2.2). • Indications that a reference level of 10 µGy/h for impacts on non-human biota above natural background will be exceeded (Aus 5f, 6, 14; State 34) (ER 2.3). *Note: The reference level for non-human biota is set as an interim criteria until such time as an agreed national approach is determined.*	• Maintain radiation doses as low as reasonably achievable, as assessed through the annual adequacy and effectiveness review (State 17e)
3.6	Greenhouse gas emissions	• Contribute to stabilising global atmospheric greenhouse gas concentrations to minimise **environmental impacts** associated with climate change.	• A reduction in greenhouse gas emissions to an amount equivalent to at least a 60% reduction of 1990 emissions, by 2050 (State 11a) (EG 2.2).	• None applicable	• Scope 1 and 2 GHG emissions for the combined mining and processing operations, and associated activities, of 0.96 Mt of CO_2-e, equal to the FY13 target (State 11b) (EG 2.2).
ID 4 GENERATION OF INDUSTRIAL WASTES					
4.1	Embankment stability of TSF	• No significant TSF embankment failure.	• No significant radioactive contamination arising from uncontrolled loss of radioactive material as a result of an embankment failure to the natural environment (ER 2.4, WA 2.1). *Note: Significant is defined as requiring assessment and remedial action in accordance with the NEPM or EPP and the Mining Code. Measurement and monitoring is carried out in response to a specific event. (State 17ki, 17kii, 17kiv)*	• Pore pressures within or adjacent to the TSF embankment which are greater than the pore pressures used in the slope stability assessment demonstrating compliance with ANCOLD guidelines (WA 2.1).	• Rate of rise of tailings at an average of 2 m per annum or less (WA 2.1). • Total TSF pond area of 35 ha or less (WA 2.1).
4.2	Waste rock containment and	• No significant adverse impact on local drainage patterns and water quality that	• All RSF seepage captured by the final open pit, as demonstrated by a numerical groundwater simulation model	• A groundwater model trend that indicates that all RSF seepage may not be captured by the final open pit,	• None applicable

ID	EM Program	Environmental outcome (State 17b)	Compliance criteria (State 17c, 17kiii)	Leading indicators (State 17d)	Target
	seepage	would compromise existing water use and water-dependent ecosystems (State 32). • No significant adverse impact on vegetation as a result of seepage from the RSF (State 32). • No compromise of current and future land uses on the SML or adjoining areas as a result of seepage from the RSF (State 32).	confirmed by monitoring (State 32) (GW 3.2). • All RSF seepage attenuated within the SML, as demonstrated by a numerical geochemical model confirmed by monitoring (State 32) (GW 3.2). • Maintain groundwater level outside the toe perimeter of the RSF not higher than 80 mAHD (20 m below ground level), based on contoured monitoring results (GW 2.2). • Overall slope of the RSF (including berms) to not exceed 35 degrees (WA 2.8). • RSF overall maximum height at 250 mAHD (WA 2.8).	should the trend continue (GW 3.2). • A numerical geochemical model trend that indicates that all RSF seepage may not be attenuated within the SML, should the trend continue (GW 3.2).	
4.3	Tailings seepage	• No significant adverse impact on vegetation as a result of seepage from the TSF (Aus 5c, 26; State 32). • No compromise of current and future land uses on the SML or adjoining areas as a result of seepage from the TSF (State 32). • No compromise of the **environmental values** of groundwater outside the SML as a result of seepage from the TSF (Aus 5c, 22c).	• Maintain groundwater level outside the external perimeter road of TSF Cells 1 to 5 to not higher than 80 mAHD (20 m below ground level) (Aus 5d, 6, 26; State 32) (GW 2.2). • All TSF seepage captured by the final open pit, as demonstrated by a numerical groundwater simulation model confirmed by monitoring (Aus 5d, 6, 24c; State 32) (GW 2.1, GW 2.2). • All TSF seepage attenuated within the SML, as demonstrated by a numerical geochemical model. confirmed by monitoring (State 32) (GW 2.3)	• An increasing trend in the groundwater level outside the external perimeter road of the TSF that indicates 80 mAHD (20 m below ground level) may be exceeded within 12 months (GW 2.2). • A groundwater model trend that indicates that all TSF seepage may not be captured by the final open pit should the trend continue (GW 2.1, GW 2.2). • A numerical geochemical model trend that indicates that all TSF seepage may not be attenuated within the SML should the trend continue (Aus 5e, 25) (GW 2.3).	• None applicable
4.4	Fauna interaction with Tailings Retention System	• No significant adverse impacts to **listed species** (South Australian, Commonwealth) as a result of interactions with the Olympic Dam TRS (Aus 5c, 18).	• No significant adverse impact on the size of an **important population of** Category 1a and 1b fauna **species** as a result of interactions with the Olympic Dam TRS (FA 2.7). *Note: Significant impact is as defined in the **Significant Impact Guidelines** and greater than predicted in the **EIS**.*	• None applicable	• Total TSF pond area of 35 ha or less (Aus 5f, 20) (WA 2.1). • A minimum liquor depth on operating TRS evaporation ponds of 250 mm (Aus 5f, 20) (WA 2.1). *Note: Operating ponds are those in normal operational use and excludes ponds that are out of service, ponds being dried for maintenance, embankment raising or other purposes, and ponds required for temporary management of excess liquids as a result of rain.*
4.5	Solid waste disposal	• No significant adverse impacts as a result of management of solid waste.	• No site contamination leading to **material environmental harm** arising from the operation of the Resource Recovery Centre (GW 2.3, WA 2.5).	• None applicable	• Increase the proportion of resources diverted from landfill from the FY13 baseline (WA 2.5).
4.6	Radioactive waste	• No adverse impacts to public health as a result of radioactive waste from ODC's activities (Aus 5c, 13; State 34). • No **significant adverse impacts to populations** of **listed species** or **ecological communities** as a result of radioactive waste from ODC's activities (State 34).	• Radiation doses to **members of the public** less than 1mSv/y above natural background (Aus 5d, 6, 13; State 34) (ER 2.2). • Deposition of project originated ^{238}U less than 25 Bq/m^2/y at the non-human biota assessment sites (ER 2.3)	• Indications that a **dose constraint** of 0.3 mSv/y to **members of the public** above natural background will be exceeded (Aus 5f, 6, 14; State 34) (ER 2.2). • Indications that a reference level of 10 uGy/h for impacts on non-human biota above natural background will be exceeded (Aus 5f, 6, 14; State 34) (ER 2.3). *Note: The reference level for non-human biota is set as an interim criteria until such time as an agreed national approach is determined.*	• Maintain radiation doses as low as reasonably achievable, as assessed through the annual adequacy and effectiveness review (State 17e). • Ensure that all radioactive waste is adequately contained and managed.

ID	EM Program	Environmental outcome (State 17b)	Compliance criteria (State 17c, 17kiii)	Leading indicators (State 17d)	Target
ID 5 INTERACTION WITH COMMUNITIES					
5.1	Community interaction	• Residents in Roxby Downs, Andamooka and Woomera trust ODC to act in their best interests.	• Community concerns are tracked and all legitimate complaints are addressed where reasonably practicable (SE 2.1).	• None applicable	• A long-term desirable trend towards a minimum housing rental vacancy rate in Roxby Downs of 5% (State 14a) (SE 2.5).

11 APPENDIX E: EMS (AS/NZS ISO 14001) IMPLEMENTATION AT OLYMPIC DAM



12 APPENDIX F: EMS RESPONSIBILITY MATRIX

EMS Elements	Asset President	Head of Production	General Managers and Managers	Head of HSEC	Senior Manager Group Legal	Manager Environment	Manager Radiation Governance	Principal Advisor Environment and Government Approvals	Superintendent Environmental Operations/ Superintendent Land and Water	Superintendent Radiation and Occup. Hygiene	Hazardous Materials Coordinator	Senior Occupational Hygienist	Senior Radiation Safety Officer	Senior Advisor Environmental Operations	Senior Advisor Environment – Land and Water	Engineer Integrated Planning	Environmental Personnel (not already listed)	Administrator Environment and Community	Analyst HSEC Reporting/ Document Controller	Superintendent Emergency Services & Security	Coordinator Emergency Services	Manager Training and Development	Manager Supply	Quality Systems Coordinator	Senior Internal Auditor	Supervisors	All Employees	Contract Owners (BHP Billiton)	Contractors Managers	Contractors employees
4.2 Environmental Policy																													
Development and review of Olympic Dam Sustainable Development Commitment	R/A			R	R	R			R	R									R					R					
4.3 Planning																													
4.3.1 Environmental aspects																													
Establish, implement and maintain procedure(s) to identify environmental aspects **of its activities, products and services**						R/A		R/A	R				R	R	R		R												
Establish, implement and maintain procedure(s) to determine those aspects that can have significant impact(s) on the environment						R/A		R/A	R				R	R	R		R												
Annual and triennial (exhaustive) reviews of environmental aspects and impacts						R/A		R/A	R				R	R	R		R												
Review of Contractor HSEC Management Plans	R/A	R/A	R	R/A		R		R	R																		R/A		
4.3.2 Legal and other requirements																													
Establish, implement and maintain procedure(s) to identify and have access to the applicable legal requirements and other requirements (OD Document No.2727)				R/A		R			R	R				R	R		R												
Establish, implement and maintain procedure(s) to determine how the legal and other requirements apply to the **environmental aspects**				R/A		R			R	R				R	R		R												
Conduct annual review and update of Olympic Dam's Environmental Obligations Register				R/A		R			R	R				R	R		R												
Conduct annual internal environmental legal compliance review				R/A	R	R			R	R				R	R		R												
Conduct triennial external environmental legal compliance review				R/A	R	R			R	R			R	R	R		R												

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4.3.3 Objectives, targets and programme(s)																														
Annual and triennial (exhaustive) reviews of objectives and targets within the EM Programs						R/A		R/A	R					R	R		R									R				
Development of annual environmental performance targets			R			R		R/A	R				R	R	R	R										R		R		
Annual and triennial reviews and update or EM Programs			R			R/A		R/A	R				R	R	R	R	R		R							R				
Annual update of Action Plan to achieve environmental objectives and targets			R			R		R/A	R				R	R	R	R										R		R		
4.4 Implementation and operation																														
4.4.1 Resources, roles, responsibility and authority																														
Provision of resources for implementation of the EMS		R/A		R/A		R/A		R/A																						
Management representatives for implementing EMS		R/A		R/A		R/A		R/A	R																					
Management review of EMS		R/A	R	R		R		R	R																R					
Understand, promote and implement site Sustainable Development Commitment	R/A	R	R	R		R		R	R				R	R	R	R	R								R	R	R		R	R
Ensure that a Contract Manager is nominated for each contract	R/A	R/A	R/A	R		R																					R			
4.4.2 Competence, training and awareness																														
Identification of environmental training needs (triennial)				R		R/A			R					R	R	R	R				R					R		R	R	
Development and implementation of environmental training materials				R		R/A			R					R	R	R	R				R					R		R	R	
Management of Contractor, Site and Area Inductions and Section Overviews						R/A			R													R						R/A		
Collation of all records on TMS																		R				R/A								
4.4.3 Communication																														

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Maintenance of site environment intranet page						R/A			R					R	R	R	R		R/A											
Submission of reports to regulators regarding environmental performance						R/A			R					R	R		R													
Forward correspondence on environmental issues to Environment Section	R	R	R	R	R	R/A	R	R																	R	R	R	R	R
Input environmental complaints into the EMS documentation	R	R	R	R	R	R/A	R	R	R																R	R	R	R	R
Maintenance of Interested Parties Register						R/A			R					R	R		R	R												
4.4.4 Documentation																														
Regular Maintenance of EMS documentation (i.e. environmental policy, EMM, EM Program, MPs, other procedures of the EMS according to OD Document No.3785 *Environmental Management System Index* and any documents including records, necessary to ensure the effectiveness of the EMS).						R/A		R	R					R	R	R	R	R						R	E				
4.4.5 Control of documents																														
Establish, implement and maintain procedure(s) to control the EMS documents (Quality Docs System)						R/A			R										R					R	R					
Implementation of Document Management Process, OD Document No.1						R/A																		R						
4.4.6 Operational control																														
Development, maintenance and implementation of standards, procedures, work instructions and safeguards	R	R	R/A																						R/A	R		R/A	R
Ensure that an MSDS is received for any hazardous material prior to its arrival at site		R/A	R/A								R/A	R													R/A	R		R/A	R
Implementation of Material Master Maintenance Process											R/A											R/A								

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Development of standards, tools and processes for evaluating material source, identification and rating of **aspects and impacts** associated with products, communication with suppliers etc.						R																	R/A							
4.4.7 Emergency preparedness and response																														
Provide the resources to ensure that Olympic Dam has a functional: Emergency Response Plan Crisis Management and Recovery Plan Fire Protection Plan		R/A		R/A		R/A			R	R	R									R	R									
Ensure that there is an adequate program of exercises to test the above plans		R/A		R/A		R/A			R	R	R									R	R									
Ensure that there are adequate numbers of emergency response personnel to deal with the identified events scenarios		R/A		R/A		R/A			R	R	R									R	R									
Establish mutual aid arrangements to deal with any prolonged emergency response		R/A		R/A		R/A			R	R	R									R	R					R				
4.5 Checking																														
4.5.1 Monitoring and Measurement																														
Develop and implement monitoring programs to assess performance of the EMP, objectives and targets, control mechanisms, legal and other requirements						R/A		R/A	R				R	R	R		R									R	R	R	R	R
Compile, analyse and report results from monitoring to appropriate stakeholders	R	R		R		R/A		R/A	R				R	R	R	R	R									R	R	R	R	R
Calibration of environmental section monitoring equipment						R/A		R/A	R				R	R	R	R	R/A													
Maintenance of environmental section Calibration Register						R								R	R		R	R/A												
Calibration of operational environmental monitoring equipment			R/A			R		R/A	R				R	R	R	R	R									R	R		R	R
Incident notification						R/A		R	R	R			R	R	R	R	R									R	R		R	R

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4.5.2 Evaluation of compliance																														
Undertake annual review of obligations within Obligations Register to assess compliance				R/A		R		R/A	R					R	R	R	R													
Records keeping and management of results from periodic evaluations of compliance with legal and other requirements				R/A		R		R/A	R					R	R	R	R													
Reporting of progress e.g. Annual Environmental Management and Monitoring Report	R/A	R		R/A		R/A	R	R	R	R				R	R	R	R													
Supply information for HSEC Monthly Reports	R/A	R	R	R		R		R	R					R	R	R	R													
Monthly Environmental Performance Reports and Updates		R	R	R		R/A			R					R	R	R	R													
Reporting actual and potential environmental incidents	R	R	R	R		R/A		R	R	R			R	R	R	R	R								R	R	R	R	R	
Monitor contractor performance		R/A	R	R		R		R/A	R	R			R	R	R	R	R								R		R/A			
4.5.3 Nonconformity, corrective action and preventive action																														
Raise non-conformances with EMS						R																		R/A	R					
Raise an incident notification for non-compliances with legislation, licences and/or obligations	R	R	R	R/A		R		R	R		R	R	R	R	R	R	R		R					R/A	R	R	R/A	R/A	R	
4.5.4 Control of records																														
File monitoring data, reports, correspondence, licences etc within the Environment Sections Library and electronic file structure as defined in Document No. 2697						R/A			R					R	R		R	R								R				
Conduct annual reviews of the Mine Closure and Rehabilitation Plan	R/A	R/A	R	R		R		R	R	R				R	R															
Conduct external triennial reviews of the Mine Closure and Rehabilitation Plan				R/A		R		R																						
Filing of environmental correspondence and records (refer to Document No. 2697)						R/A			R					R	R	R	R	R/A													
Maintain log of external correspondence						R/A			R									R/A													

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4.5.5 Internal audit																													
Develop annual program for internal EMS and other audits	R/A	R/A	R	R		R/A		R	R	R			R	R	R	R	R							R/A	R		R/A	R	
Schedule, implementation, filing of environmental audits, raising of critical actions and tracking of progress						R/A		R	R	R														R/A				R/A	
Develop program of external environmental audits for the EMS cycle period						R			R														R	R/A					
Scheduling and implementation of internal EMS audits	R/A	R/A	R	R		R			R	R													R	R/A					
Major and minor non-conformances and observations arising from EMS audits issued and tracked	R/A	R/A	R	R		R			R	R													R	R/A					
Scheduling and organisation of external EMS Audits				R		R/A																		R					
4.6 Management review																													
Organisation of Quarterly **Environmental Management System** Management Reviews						R/A			R																				
Provision of environmental information for the environmental section of the integrated EMS and Quality Management System Management Review						R/A			R				R	R	R	R	R												
Raise and monitor corrective actions arising from the Management Review						R/A			R																				
Implementation of Continuous Improvement Opportunities		R/A	R																						R		R	R	
Log and file record of meeting minutes						R/A			R									R											

R = Responsibility

A = Authorisation

13 APPENDIX G: AMENDMENTS TO THE EMM FY13

A summary of major changes to this EMM is provided. Individual changes have not been itemised.

Section	Description	Change Explanation
Section 2.4.2	Section updated.	Updated to reflect changed Olympic Dam operational scope.